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A Report
ON
THE INFLUENZA EPIDEMIC IN THE BRITISH ARMIES IN FRANCE, 1918.

BY
THE INFLUENZA COMMITTEE OF THE ADVISORY BOARD TO THE D.G.M.S., FRANCE.

Epidemiology.

The epidemic of influenza began by a few local outbreaks in the First and Second Armies in April and May. It appeared both at Rouen and Wimereux in April. At the end of May it reappeared with great violence in the Second Army. It spread apparently a little later in the First Army, and began to appear in the Third Army at about the same time, and in the Fourth Army towards the middle of the month.

The numbers affected were very great. For instance, the Second Army admitted to its casualty clearing stations during the seven days ending June 12th 1,921 cases, and in the following seven days 3,851. The admissions continued at this high rate throughout the greater part of June, the highest for one day being on June 25th, when 683 were admitted to clearing stations. These figures take no account of the many thousands of mild cases treated in their own lines or in field ambulances. From June 25th onwards the rate fell rapidly and steadily, and by the middle of July was averaging 150 daily. By the end of the month it was still further reduced to about 70, and had fallen to about 50 daily by the middle of August.

In the First Army the total admissions to casualty clearing stations for influenza (diagnosed P.U.O.—three-day fever) between May 18th and July 2nd was 36,473.

This is not the first time that *B. influenzae* has appeared in the armies. On the contrary, it has been frequently found in cases of bronchopneumonia, especially during the winter of 1916–17. The question naturally arises why it should not have become epidemic before. That question, however, arises in all epidemics. There seems no reason whatever to suppose that the power of resistance in the troops is lowered; on the contrary, the general health of the army is probably as good now as ever it was.

The bacillus itself may have become more virulent, or there may have arisen some conditions favouring its growth and producing a very large increase in its numbers. If so, these conditions seem to be almost world-wide, as the disease has spread itself in Europe from Spain to France, Italy, Germany, and England, and there was an epidemic in the United States a year ago.

The disease was extremely contagious. In infected formations large numbers were affected at or about the same time. This was in strong contrast to the behaviour of trench fever.

The consulting physician to the Fourth Army reports that on visiting an artillery school 320 strong 90 men, and in a labour company 520 strong 140 men, were found affected.

In the Second Army a brigade of artillery had one-third of its whole strength taken ill within forty-eight hours, and in the brigade ammunition column only 15 men were available for duty one day out of a strength of 145.

At one of the army schools the infection spread by huts. On May 5th 2 cases occurred in a hut, on May 6th 2 more, and on May 7th 24. On May 8th 20 cases occurred in another hut.

A Chinese labour company was also extensively attacked. Commencing on May 9th with 7 cases, the daily admissions were successively 21, 23, 65, 40, 11, 5, and 2—a total of 174 cases in eight days, or over half the strength.

Incubation Period.

The period of incubation was from two to four days Thus, Major Clarke (No. 19 Casualty Clearing Station) reports:

Twenty-six men forming part of the personnel occupied a double hospital marquee. On the morning of June 18th one of them was admitted to hospital with influenza; 18 others were taken ill between 7 a.m. on June 21st (72 hours) and 12 midnight on June 22nd (114 hours). The other 7 men escaped.

The following instance is reported in one of the wards o No. 55 General Hospital.

The attached diagram represents a portion of a surgical ward into which medical cases were sent owing to pressure on the medical side. The two medical cases occupied the beds 62 and 10.

The case in bed No. 62 was admitted on June 7th with the diagnosis of "bronchitis." This patient coughed a good deal and was dirty in his habits, spitting all about him. He had a cough with copious expectoration and crepitations at both bases. These crepitations, coupled with the length and character of the pyrexia at the casualty clearing station and the rapid recovery, point to this being one of influenzal rather than ordinary bronchitis.

On June 9th the case in bed No. 63, suffering from a septic knee, had a sudden rise of temperature without obvious physical signs in the lungs. In view of the possibility of septicaemia (infection of knee—*S. aureus*), blood was taken for culture. From this small Gram-negative rods were recovered, which from the aspect of their colonies on blood agar, their staining reactions and morphological characters conformed to *B. influenzae*.

The diagram shows how the cases spread, in the following days, so as to infect the occupants of beds on either side of bed No. 62. The larger gaps between the beds owing to splint apparatus, etc., may explain why only one case arose on the side of the ward containing beds Nos. 4 to 16.

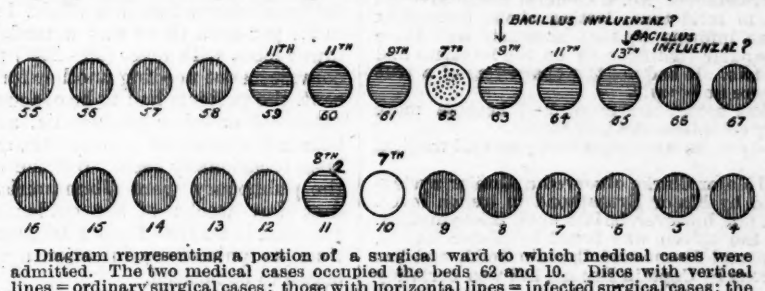


Diagram representing a portion of a surgical ward to which medical cases were admitted. The two medical cases occupied the beds 62 and 10. Discs with vertical lines = ordinary surgical cases; those with horizontal lines = infected surgical cases; the dotted disc = a medical case with "influenza." The dates above discs are for June, 1918

This outbreak is being described elsewhere in the form of a separate paper by the medical officer who had charge of the cases.

The mild character of the epidemic may be gathered from the figures of the garrison in the Calais area. Between June 24th and July 11th about 5,000 cases of influenza reported sick. The majority of these, 90 per cent., were so mild that they were treated in detention wards in the camps and barracks of the various units in the Calais area. The case mortality was 0.2 per cent. of the total number.

Symptoms and Clinical Course of the Disease.

The onset was sudden in most cases. In a small minority it began gradually and reached its height in from one to six hours. Rigors occurred in many of the cases.

The initial symptoms were headache, pains in the back and limbs, and a feeling of weakness. The pains in the back and limbs were vaguely referred to the muscles. True shin pains, such as are common in trench fever, were hardly ever observed, and indeed the pains were seldom felt below the knees.

Major Scarisbrick (No. 49 Field Ambulance) observing 440 cases found the following to be the frequency of the different sites of pain:

1.	Pains in the head	73 per cent.
2.	Pains in the back	45 "
3.	Pains in the eyes	43 "
4.	Pains in the muscles of limbs ...	41 "
5.	Pains in the joints, knees	32 "
6.	Pains in the hips	22 "

Ankles and shoulders rarely.

1 and 3, and 2 and 4, were associated respectively.

The pains were of a severe aching character. Pain in the head was referred to the frontal sinuses, that in the eyes to the back of the globe. Some medical officers, however, report that the pain was referred to a higher level.

These initial symptoms lasted as a rule two or three days. The temperature usually reached its acme on the first, but occasionally on the second day. The highest point was commonly between 102° and 103° F., but 105°

has been noted, and some cases never rose above 100° F. It usually fell by lysis, but in a small minority a fall of 3 or 4 degrees was completed in twenty-four hours. In many cases the temperature was normal on the fourth day; in some the lysis was not complete until the eighth. Captain J. Ramsey (No. 64 Casualty Clearing Station) by a composite chart formed on 104 cases found the temperature to reach the normal on the sixth day. A considerable number of the very mild cases completed the whole pyrexial phase within forty-eight hours, and made a rapid convalescence.

The pulse was rapid during the first two days, though it seldom reached 120, but by the fourth day was usually between 70 and 80. In a few cases tachycardia developed during convalescence. Endocarditis is reported in two cases of autopsy. Dilatation of the right heart occurred frequently as a result of pulmonary disease and in a few cases pericarditis was noted.

In the earlier cases catarrhal symptoms were extremely uncommon, but in the later stages of the epidemic pharyngitis and tracheitis were present in a considerable proportion of the cases. The latter frequently caused soreness behind the sternum. The serious complications which developed later are discussed below. Several symptoms of less importance were noticed.

1. In some cases a rash was observed, usually of a mixed urticarial and erythematous character, principally seen on the neck, the shoulders, the wrists, and the dorsum of the feet (Lieut.-Colonel Warrack, Major Alexander, Captain J. Grant, and Captain R. W. Fergusson). About the middle of May some twenty men of the personnel of No. 6 General Hospital went down with influenza of mild type, lasting about forty-eight hours. Major Torrens informs us that in nearly half these cases there was a papular itching rash on the forearms and shins lasting a day or two. It had not the characters of a true urticaria, and there were no wheals.
2. Labial herpes was sometimes seen, and became more common as pulmonary complications increased.
3. Conjunctivitis and coryza were reported by several medical officers.
4. Major McNee and Major Clarke observed a similar nystagmus to that described by Major Drummond in trench fever. Too much stress must not, however, be laid upon this symptom.
5. Enlargement of the spleen was found by Major McNee, Major Clarke, and Colonel Hume and Captain Todd, and has been reported *post mortem* by Captain Boome, but was certainly not common.
6. The tongue was usually covered with a slight fur except for a clear marginal zone. This was grey or white, according to its degree, but the yellow or brown fur common in trench fever seems to have been rare.
7. Anorexia was common. Loss of taste and loss of smell were observed by Major J. K. Wilkinson.
8. Vomiting was common in the first day or two, diarrhoea less frequent. At the commencement of the epidemic, in May, several localized outbreaks were ushered in by vomiting and tenesmus in a majority of the cases.

Colonel W. E. Hume and Captain Todd at No. 42 Casualty Clearing Station found the following figures:

1. Headache and general muscular pain...	76	per cent.
2. Shivering or definite rigors	41	,,
3. Suffused eyes	73	,,
4. Pharyngitis	100	,,
5. Furred tongue	100	,,
6. Constipation	52	,,
7. Spleen palpable	14	,,

Progress.

In the earlier stages of the epidemic progress was remarkably rapid, and convalescence was established without any sequelae. Three days' incubation, three days' fever, and three days' convalescence was about the rule. It was noteworthy that the mental depression so often associated with a post-influenzal state was practically never seen. Later on, however, as both the intensity and the virulence of the epidemic increased, convalescence became more protracted as the febrile period lengthened, and the bronchitis infection became more pronounced.

Relapses.

A short relapse of fever and symptoms, without any other complications, was occasionally seen about the end of the first week. This has become more frequent in the later stages of the epidemic.

Complications.

At a later stage of the epidemic complications, which at first had been very rare, increased both in number and in severity. They chiefly affected the lungs, and consisted of bronchitis, bronchopneumonia, and lobar pneumonia. The distinction between the first two is not easy either in theory or in practice. The inflammation in most cases probably spreads downwards from the upper air passages to the bronchi, and from them to the bronchioles and the pulmonary alveoli. In others it may have begun in the smaller tubes, and Major McNee and others have reported cases of true lobar pneumonia.

The cases of bronchitis and bronchopneumonia were severe and prolonged, with a high and very irregular temperature, a rapid pulse, dyspnoea, and cyanosis. The sputum was sometimes a frothy or muco-purulent fluid, but often of the green nummular variety which Major General Bradford has described. Many of these cases proved fatal.

The cases of true lobar pneumonia showed on the whole a more regular fever, but they frequently terminated by lysis. Pleurisy and pleural effusion occasionally occurred. This was especially so amongst the Chinese, and in them was associated with tubercle. In one or two cases an interlobular empyema was found in which the *B. influenzae* was the only infection.

In 1,700 cases admitted June 15th to June 29th into No. 1 Canadian Casualty Clearing Station, 42 patients had bronchopneumonia (2.6 per cent.) and 3 patients had lobar pneumonia. Of the 45 patients 4 died.

In the First Army the estimate was that 1 per cent. of all cases admitted to casualty clearing stations developed bronchopneumonia or lobar pneumonia, of which 10 to 15 per cent. died. Major Scarisbrick in 440 cases at a field ambulance found a slight bronchitis in 22 per cent.; in 9.7 per cent. there was a moderate bronchiolitis of the lower lobes with fever (99°–102°) for about ten days, and a convalescence needing another fortnight; in another 9 per cent. the patients had to be evacuated for severe bronchitis, catarrhal or lobar pneumonia, and pleurisy. There have been a few cases of pericarditis, and suppurative otitis has been occasionally seen. But the chief complications after the pulmonary were albuminuria and nephritis. In the first few weeks of the epidemic cases were generally reported to be free from albuminuria, but about the same time as pulmonary infection appeared albuminuria also began to be noticed.

The Medical Investigation Committee have already (Reports of the Committee on War Nephritis No. 3, p. 11) drawn attention to this connexion. "In the winter of 1916–17 a considerable number of cases of nephritis occurred as a complication of the very severe bronchitis and bronchopneumonia prevalent at the time." The *B. influenzae* was then also found in a large proportion of the cases. At one casualty clearing station in the Second Army, during the recent epidemic, 22 such cases were observed by Captain Symonds, of whom 10 died. In some of these, sections of the kidney showed changes which were considered to be indicative of a renal lesion prior to the influenzal attack. A profoundly toxic condition, associated with a dry, black tongue, pronounced mental symptoms, and a grey lividity of the face, characterized these cases, and though diminution of the quantity of urine was not common, the percentage of albumin passed was very high.

Another but much rarer complication has been meningitis involving both brain and spinal cord. The *B. influenzae* was found in the meninges, and, in one case that recovered, in the cerebro-spinal fluid. Two others presented the same train of symptoms, but though the cerebro-spinal fluid was under high pressure the *B. influenzae* could not be recovered from it. In a third similar case, which recovered, optic neuritis existed.

At a casualty clearing station in the Second Army four such cases occurred, of whom three died and one recovered. In three of them the fluid was "gin clear" and in one slightly milky. Both before and after death bacteriological cultures and smears were negative.

Diagnosis.

It is obvious that the diagnosis of the present epidemic disease from trench fever could not be made from the clinical symptoms until sufficient time had been given to show that there were no such true relapses as occur in the latter. So similar were the symptoms that one medical officer attacked with influenza believed it was a return of the trench fever from which he had previously suffered.

There is a form of trench fever in which one bout alone

occurs. The difficulty of distinguishing this from influenza was mentioned in the second report of the Trench Fever Committee. The point of chief importance is the epidemic character. Where considerable numbers of a unit are affected simultaneously it may be assumed at once that the disease is not trench fever. Where, as in the present instance, Pfeiffer's bacillus is recovered from a high proportion of the cases, the epidemic may be assumed to be influenza.

The pulmonary and renal complications form a further distinction. In trench fever the sequelae are almost entirely confined to the heart.

Treatment.

The treatment adopted throughout has been symptomatic.

BACTERIOLOGY.

From the resemblance to influenza, both as regards the infective nature of the disease and the general character of the symptoms, the efforts of bacteriologists were, for the most part, directed to the discovery of *B. influenzae* Pfeiffer in the secretions from the respiratory tract, nasopharynx and circulating blood, and from the lesions of those cases which came to the autopsy table.

Methods Employed for the Isolation of B. Influenzae.

Although cultures of this organism were obtained from material obtained on swabs from the throat and nasopharynx, the method which appears to have been most successful was to wash away englobing pharyngeal secretion from the fresh tracheal sputum and to stroke a loopful upon a plate of nutrient agar containing blood. The particular manner in which the addition of blood was made seems to have been immaterial. Pfeiffer's original technique (sowing on an agar slope upon which a few drops of blood had been smeared) gave good results in some hands, but most observers seem to have preferred blood-agar made by mixing about half a cubic centimetre of citrated human or rabbit's blood with 5 c.cm. of nutrient agar made with the tryptic digest of meat or casein.

It was found better to heat the blood for a few minutes to 55° C. before making the slopes. Excellent growths of *B. influenzae* were also obtained on blood-agar heated rapidly to 80° C. (Fleming). By this treatment the haemoglobin is destroyed and the medium rendered opaque, which presents some disadvantages. Most observers have recommended that the plates be incubated for forty-eight hours.

In searching for *B. influenzae* in the circulating blood 5 to 10 c.cm. were withdrawn from a vein into citrated broth and incubated for three days.

Results.

At the beginning of the epidemic the attempts of competent bacteriologists to isolate *B. influenzae* from the sputa, nasopharynges, and blood of cases were so seldom successful that doubt arose as to whether this organism was the etiological factor in the disease. Although Pfeiffer's bacillus was not often isolated, the sputum contained numerous *pneumococci*, *streptococci*, and *Micrococcus catarrhalis*, the relative preponderance of these organisms being in the order above named.

The nature of the pneumococci isolated was examined in detail (Sladden) and found to belong to Type IV of the Rockefeller classification, this group being made up of varieties which will not conform to Types I, II, and III. The pneumococci studied by Sladden were found to be of low virulence for mice and possibly represent strains which are inhabiting the respiratory passages normally, and had found the catarrhal conditions set up favourable to their greater multiplication.

As the epidemic proceeded, however, bacteriologists discovered that it was much easier to recover *B. influenzae* from those cases in which definite catarrh of some portion of the respiratory tract had ensued with the production of muco-purulent discharge—that is, subsequent to the first few days of the disease. Those bacteriologists who selected such cases for their investigation (Fleming, Fraser, Perry) succeeded in recovering *B. influenzae* in 80 to 100 per cent. of their cases.

When tracheitis, bronchitis, or bronchopneumonia existed *B. influenzae* was generally recovered with ease (McNee, Fraser, Martin), few other organisms being seen on examination of a stained film of the fresh expectoration; they often occurred in great numbers, and cultivation of sputum from these cases afforded nearly pure cultures of *B. influenzae*. *B. influenzae* was recovered from the blood in two cases (Peters, Cookson) during the height of the initial fever, and from the cerebro-spinal fluid in three cases in which meningitis developed (Moodie, Ferguson).

Table showing the Proportion of Successful Recoveries of B. influenzae from Various Materials, Compiled from Reports sent in by Bacteriologists.

Material Examined.	No. of Attempts.	No. of times *B. influenzae* Recovered.
Sputa...	222	91
Nasopharyngeal mucus	164	60
Blood...	68	2

These figures probably give an exaggerated idea of the ease with which the organism is recoverable from cases of influenza. Only those reports in which the number of observations made and the results arrived at were stated could be utilized for analysis. Some laboratories reported in general terms, such as "numerous observations uniformly unsuccessful," or "several attempts with but two successes." A further discount must be made for the tendency to record hits and not misses.

Morphology and Cultural Characters of the Bacillus Isolated.

The small Gram-negative bacillus so commonly found associated with the cases corresponded in every way with Pfeiffer's *Bacillus influenzae*. In direct smears of the sputum or lung it often occurred in patches. It was pleomorphic. Most individuals were small bacilli, varying in length from 0.7 to 1.2 μ, and in breadth from 0.3 to 0.4 μ, with slightly rounded ends. Diplococcal forms, 0.37 by 0.3 μ, were very common amidst the bacillary forms (Martin). It stained well with dilute carbol fuchsin.

As has been previously recorded of *B. influenzae*, these bacilli, although generally requiring the presence of blood for their propagation, sometimes grew upon ordinary nutrient agar when this was planted from sputum or nasopharyngeal mucus. On subculture they failed to grow on ordinary agar.

On the primary culture on blood agar from the sputum the colonies, after twenty-four hours' incubation, were from 0.1 to 0.2 mm. in diameter, hemispherical in shape, and quite clear. Those colonies which had developed in the neighbourhood of colonies of staphylococci or pneumococci were larger than the average. On subculture upon blood agar they grew well, the colonies increasing in size with each successive subculture until in the case of some strains they attained a diameter of 0.5 to 1 mm. after twenty-four hours' incubation. They failed to grow upon nutrient agar, or serum agar, or inspissated egg yolk media. The bacilli were larger in cultures than they were on the original sputum, varying in shape and dimension from 1.5 by 0.5 μ to 0.6 by 0.4 μ. Colonies in the primary cultures usually exhibited involution forms 5.6 μ in length. Some observers encountered long filaments 30 μ long, and coarse clubbed forms, as well as filaments showing irregular staining. On subculture all gave rise to colonies the individuals of which possessed quite ordinary morphology. Certain strains showed a tendency to revert to pleomorphism. Similar aberrant forms were described by Pfeiffer in 1893 (*Zeit. f. Hyg.*, 13) as pseudo-influenza bacilli. Grassberger (*Zeit. f. Hyg.*, 24), however, found typical strains of *B. influenzae* to possess this tendency to pleomorphism.

The cultures isolated in France were found to die out very soon, even when kept from drying and at a low temperature. Subculture at least weekly was found necessary to maintain them.

Virulence.

A few observations were made upon their pathogenicity for animals. Rabbits supported a whole agar slope intravenously. Fraser injected "a large amount" of a culture into the circulation of a rat. The rat died three days later with a haemothorax and the bacilli were recovered from

the heart blood. Of two other rats injected intraperitoneally with sputum containing "enormous numbers" of these small Gram-negative bacilli one died overnight and the bacillus was recovered from the peritoneal fluid, and the other suffered no ill effects.

These few experiments indicate that the organism possessed little virulence for these small animals, a result which is in conformity with previous observations on *B. influenzae*, to which the only animal so far known to be susceptible is the monkey.

Morbid Anatomy and Bacteriology of Cases Dying from "Influenza."

The following summary of thirty autopsies by Captain Shore, R.A.M.C., illustrates the gross pathological changes met with and the frequency with which they occurred.

Report on the Morbid Anatomy of Deaths from Influenza.

Material.—Autopsies were made during June and July, 1918, upon 30 cases in which the clinical diagnosis was "influenza." The patients were not all previously healthy, for in 7 cases (23.3 per cent.) obsolete tuberculosis, pulmonary or glandular, was found. (In a previous series of 1,500 consecutive autopsies the total incidence of tuberculosis was 9.6 per cent.) Two patients had chronic nephritis and one hydronephrosis (unilateral). Old pleuritic adhesions were present in 12 cases. With these exceptions, the patients were apparently previously healthy. None were suffering from wounds. The most striking lesions were those in the lungs and heart.

Lungs.—In one form or another pneumonia was present in every case. The majority had bronchopneumonia, which had a distinct tendency to become confluent, and to show a condition closely resembling the early grey stage of lobar pneumonia. Undoubted lobar pneumonia was only once found. A few cases (5) were found in which the pneumonic areas were small, and shotty when felt between the fingers, and closely resembling miliary tuberculosis. Microscopic section shows the small patches to consist of consolidated lung (generally with fibrinous exudate) surrounding inflamed bronchioles. The name "bronchiolitis" is applied to the condition, but "miliary pneumonia" seems more descriptive. No bacteriological investigations were made of these cases, so it is not possible to say if they differ from the more usual form of bronchopneumonia in that respect. In two cases the process passed on from confluent bronchopneumonia to abscess formation. Marked emphysema occurred in two cases, involving chiefly the anterior border of the lungs. In five there was an excessive amount of collapse, chiefly along the vertebral border of the lung. Two of these cases showed a small amount of pleural fluid, but in the other three the pleura was dry. Subpleural and interstitial haemorrhages were seen in 18 cases, but only as small localized areas. Purulent bronchitis was present in 14 cases.

Pleura.—Twenty-four cases showed recent pleurisy; 14 of these were dry, but in 10 a varying amount of purulent or seropurulent fluid was found—never more than a pint and generally only a few ounces. In 15 cases the bronchial or tracheal glands were markedly enlarged and inflamed. In a few cases more distant glands, as retroperitoneal and even inguinal, were affected.

Heart.—One of the most striking features of the morbid anatomy of these cases is the constant occurrence of dilatation of the heart, accompanied by nearly as constant myocardial changes. Twenty-nine out of 30 cases showed marked dilatation of the heart—chiefly of the right side, but very commonly of the left side as well, and 21 cases showed myocarditis demonstrable to the naked eye. The latter took the form of a general pallor and softness of the myocardium, with mottling and frequently subpericardial and subendocardial haemorrhages, similar to those seen beneath the pleura. These were not infrequently noticed on the interventricular septum, and on the papillary muscles. Endocarditis was found of the mitral valve in two cases. The vegetations were small and numerous, and obviously recent; in one case there was a fair amount of recent thrombus adherent to the vegetations. In practically all cases the right side of the heart was distended with the yellow "agonal" or "chicken fat" clot found so constantly in pneumonia. Pericarditis was not found.

Spleen.—In most cases the spleen was a little enlarged. The largest weighed 15 oz., the smallest 4 oz., and the average weight of the series was 7½ oz. The spleen was generally pale and soft, and showed a marked enlargement of the Malpighian corpuscles. In a few cases it was congested. No infarcts were found.

Liver.—The livers of these cases did not present any striking features. Most were pale and inclined to show early fatty changes. Some few showed chronic or relatively chronic congestion, presenting a "nutmeg" appearance. In three cases a mild degree of jaundice was present, but there were no signs of biliary obstruction.

Kidney.—Apart from the two cases already mentioned as having chronic nephritis ten cases showed a marked degree of "toxic nephritis." Sections were made of only two of these, but they showed no glomerular change, only cloudy swelling and a little fatty change in the tubules. In these ten cases the kidneys were flabby, pale, and a little swollen. The capsule was easily removable without tearing the surface. Stellate veins were prominent on the surface. There appeared no divergence from the normal proportions of cortex, medulla, and intrapelvic fat. Their average weight was 12½ oz. the pair, the average for the series being 12 oz. In one case the kidney had a "flea-bitten" appearance, and on section showed, as well as the condition described, hyaline thrombosis of the afferent glomerular vessels. The glomeruli appeared to be practically all affected, which would account for the sudden and complete suppression of urine, without previous haematuria, which led to the patient's death. This was one of the cases which showed abscess formation in the lung.

Brain.—Cerebral abscess was found in one case, in which purulent bronchitis, but no particular bronchiectasis, was present. Meningitis was not found.

Summary of 30 Cases.

Obsolete pulmonary or glandular tubercle was present in 7=23 per cent. (in previous series of 1,500—9.6 per cent.); chronic nephritis in 2; pleuritic adhesions in 12—bilateral 4, unilateral 8.

Lung.—Pneumonia was absent in none.

Bronchopneumonia was present in	25
Confluent pneumonia	11
Lobar pneumonia	1
Bronchiolitis or "miliary pneumonia" ...	5
Pulmonary abscess	2
Pulmonary collapse (2 with small effusions) ...	5
Marked emphysema	2
Purulent bronchitis	14

Pleura.

Recent pleurisy	24
Bilateral	15
Unilateral	9
Effusion	10
Subpleural or interstitial haemorrhages ...	18
Enlarged and inflamed bronchial glands ...	15

Heart.

Dilatation	29
Myocarditis	21
Endocarditis	2
Pericarditis	0

Spleen.—Average weight, 7½ oz.; mostly soft and pale.

Liver.—Inclined to fatty change; slight toxic jaundice in three cases.

Kidney.—"Toxic nephritis" occurred in 10. Average weight 12½ oz. the pair. One showed hyaline thrombosis of glomerular vessels.

Brain.—Abscess was present in one case showing purulent bronchitis. Meningitis was not found.

Reports of 46 additional autopsies have been contributed from various other pathologists. The predominating lesion was:

Purulent bronchitis in	12
Bronchopneumonia in	29
Lobar pneumonia in	5

In all but two cases the respiratory passages contained purulent exudate. In the two exceptions consolidation was of lobar type, and confined to one lobe (McNee). In the cases with purulent bronchitis there appears to have been little or no consolidation. The commonest condition described is one of purulent bronchitis with bronchopneumonia often associated with fibrinous exudate upon the pleural surface (Miller, McNee, Fraser).

The lungs are described as greatly congested and as exuding blood-stained watery fluid from the cut surface.

The extent of the bronchopneumonic areas varied from numerous areas a few millimetres in diameter, surrounded by regions in which haemorrhage had occurred, to confluent bronchopneumonia involving the greater portion of a lobe.

Sections of the lungs showed the same irregular patches of consolidation with alveoli filled with leucocytic exudate or blood and often interspersed with emphysematous portions. The surrounding vessels were greatly distended, and the mucous membrane of the bronchioles swollen and disintegrating.

Pneumococci were seen in the alveoli amidst the leucocytes, and sometimes in immense numbers, but in only a few instances were bacilli resembling Pfeiffer's bacillus recorded.

Cultures were made from the bronchopneumonic areas in fifty-three instances. Pneumococci were invariably recovered, and in forty cases bacilli resembling *B. influenzae* also. Similar bacilli have been isolated from the meninges in cases dying with meningitis (Ferguson), and along with pneumococci from the fibrino-purulent pleural effusion (McNee).

The only lesions in other organs recorded were congestion of the kidneys with small haemorrhages in the pelvis of the kidney (McNee). In one instance small haemorrhages in the white matter of the brain were observed (McNee).

The Number and Distribution of the Leucocytes in the Blood.

Several pathologists made a few observations upon this, but finding no significant variation in uncomplicated cases did not pursue this line of inquiry.

Thirteen instances are recorded. In these the total number of leucocytes varied between 6,000 and 11,000 per cubic millimetre, and the distribution was within normal limits.

Evidence of the Production of Antibodies to the Haemophilic Bacilli Isolated.

It is common experience that an attack of influenza leaves little or no immunity. Indeed, it is the opinion of many physicians that one attack may predispose to another. Since, however, cases recover, some useful reaction on the part of the patient's tissues obviously occurs, and the pessimistic view of predisposition to a second attack is explained to some extent by the continued presence of the bacilli in some of the crannies of the upper respiratory tract, where they lead a saprophytic existence, and are ready to reinfect should opportunity arise.

Animals injected with dead cultures of influenza bacilli do not develop antitoxic or bactericidal properties in the serum but agglutinins may be aroused to a small extent.

The serum of convalescents was examined for the presence of agglutinins in a few instances.

The serum of five patients, taken two to three weeks after the onset, failed to show a significant excess of agglutinins over and above that of normal persons (Martin).

Six other cases whose serum was examined four to ten days after the onset agglutinated a culture isolated from one of them in dilutions of 1 in 80 to 1 in 320 in different cases; whereas six normal serums failed to agglutinate the same emulsion in dilutions higher than 1 in 20 (Cruickshank). In both series of observations the macroscopic method was employed, and the tubes were kept at 50° C. for four hours.

The serums of five convalescents were examined for specific antibodies by the method of Bordet and Gengou. Indication of a certain amount of complement fixation was given by some, but not sufficiently greater than the normal serums used as controls to be regarded as significant (McGowan). Perhaps too long a time (two to three weeks) had elapsed since the onset of infection before the observations were made.

Some observations (Martin) on the phagocytic activity of the leucocytes in sputum indicate that increased phagocytosis of the haemophilic bacilli occurs as a response to infection. The sputum of three cases in an epidemic who suffered from bronchitis for some days was examined daily in an absolutely fresh condition. These particular sputa contained each day innumerable numbers of small Gram-negative haemophilic bacilli, and when stroked upon blood agar afforded nearly pure cultures. For twelve, fourteen, and seventeen days respectively from the onset of illness, although the sputum contained abundant pus cells, the bacilli were all extracellular. Then with striking suddenness the picture changed and the majority of the leucocytes contained the small bacilli often to the number of forty to fifty per cell. After the periods mentioned, active phagocytosis was observed so long as the sputum contained the bacilli. In many cells they were obviously undergoing digestion, being enclosed in minute vacuoles and having lost their power of taking up the carbol-fuchsin used to stain the specimens. In each case coincident with the observation of phagocytosis improvement occurred in the condition of the patient and the sputum became more purulent but rapidly diminished in quantity. Whether this occurrence of phagocytic activity was conditioned by the formation and outpouring of opsonins was not determined, but it appears likely that this interpretation is just.

Consideration of the Evidence Pointing to B. influenzae as the Cause of the Epidemic.

Sanction for regarding Pfeiffer's bacillus as the etiological factor in influenza rests upon:

1. The frequent discovery of this organism in the respiratory tract of persons suffering from this epidemic disease, whereas it is uncommon to find it in persons who have not recently become convalescent from influenza.

2. *B. influenzae* has been recovered from the blood of a few of the severe cases during an epidemic.

3. It commonly occurs in the lesions of those cases which succumb to complications, such as pneumonia and meningitis.

Indirect evidence from the presence of immune bodies in the serum of convalescents, such as occurs in whooping-cough, has not, we believe, been forthcoming hitherto.

The experience of the recent epidemic amongst British troops in France has been that cases in which catarrh was present and suitable material forthcoming for examination have also been associated with the presence of small haemophilic bacilli in the respiratory tract.

The frequent failure of bacteriologists to recover *B. influenzae* from cases during the first few days of their illness when uncomplicated by catarrh, and their absence from or presence in small numbers in the sputum, even when such is forthcoming at this stage, is no new experience, and has led several bacteriologists to question the essential etiological significance of this microbe and to regard its later presence in the sputum as an epiphenomenon.

The difficulty in discovering *B. influenzae* in early cases may, however, be attributed to the bacilli multiplying in the mucous membrane of the trachea and bronchi without at first producing an excess of reactive secretion.

As regards the presence of Pfeiffer's bacillus in the blood, the recent experience coincides with previous experience. It was recovered from the blood in two out of sixty-eight attempts, both in serious cases of the disease. It was found twice in the cerebro-spinal fluid of cases in which meningitis supervened, and the association with post-influenzal pneumonia was striking, it being recovered in forty out of fifty-three instances at the autopsy.

Some immunological observations made during the recent epidemic also lend support to the view that *B. influenzae* was the cause of the epidemic.

The amount of agglutination observed by Cruickshank in the serum of his cases four to ten days after the onset of the fever is certainly significant of infection by the bacilli isolated by him, and perhaps the failure of other bacteriologists to observe this may have been due to their waiting too long before undertaking the tests. Further, the sudden development of phagocytic activity by the leucocytes on or in the mucous membrane and its coincidence with improvement of the patient's condition and disappearance of catarrh is highly suggestive of a definite reaction on the part of the host to infection by these particular microbes.

"SPACING OUT" IN THE PREVENTION OF MILITARY EPIDEMICS OF CEREBRO-SPINAL FEVER.

BY

CAPTAIN J. A. GLOVER, M.D., D.P.H., R.A.M.C.

We were crowded enough to cause a pestilence among us.
Defoe.

THE main etiological factors producing military outbreaks of cerebro-spinal fever appear to be six—namely:

1. *Season*—the first quarter of the year.
2. *Severe weather* of all kinds and particularly sudden variations, east winds, and intense cold.
3. *Antecedent epidemics of influenza.*
4. *Causes temporarily lowering resistance*, such as antityphoid inoculation, fatigue, strenuous training, nostalgia, railway journeys, and the strangeness of barrack life to the new recruit.
5. *Overcrowding.*
6. *A high carrier rate* of epidemic strains of the meningococcus in the population at risk.

The first two factors are altogether beyond our control, the third and fourth are very largely so, but are susceptible of many ameliorations by forethought. The fifth and sixth factors are almost entirely in our hands, and at home at any rate, after four years of war, no plea of military necessity for overcrowding can be accepted. As the Commissioners of 1861 said, "In any case overcrowding should utterly be put an end to." These two factors are in fact indices of the efficiency of our sanitary stewardship.

Asked to define overcrowding, we may say that overcrowding is the slightest excess over the "mobilization standard." This standard is the utmost concession that can be safely made to military emergency. It gives the least possible space that will just suffice to fulfil the lowest permissible standards of the most indulgent hygiene. Anybody who doubts should smell the early morning air of a

hut in which have slept its full mobilization number of men. Energetic orderly medical officers who care to make 4 a.m. rounds of the barrack-rooms and huts of the units under their care will find the nose an excellent guide.

Mobilization standard means as a rule an increase of 50 per cent. of the number allowed by peace standard. The "peace standard" laid down by the Royal Commission of 1861 enjoins 60 sq. ft. floor space and 600 cubit ft. air space per man, and a distance of 3 ft. between beds.

As the ordinary barrack-room accommodated 24 men in peace time, mobilization standard means usually 36 men, and owing to fireplaces, cupboards, etc., with 36 men the beds are only 1 ft. 4 in. apart, instead of the 3 ft. of "peace standard." This number of men, 36, is still frequently exceeded, and I have known 48 and even 57 men sleep in barrack-rooms of 24 peace standard in most distinguished regiments.

Most of the huts erected since the war are of two main types, the first 60 ft. by 20 ft., the second 60 ft. by 15 ft. With the first type (60 ft. by 20 ft.) "mobilization" standard means thirty men, and (after allowing for the stove in winter) about 1 ft. 4 in. between beds; whereas, with the second type (60 ft. by 15 ft.), "mobilization" standard (often transgressed with this type) means twenty-two men, and at least 2 ft. 6 in. between beds.

Assuming equal supervision of ventilation and rigid adherence to mobilization standard in this respect, the smaller pattern scores heavily. But it is this fatal beauty of space between the beds that affords great temptation to hard-pressed and hygienically unprincipled authorities to put in more beds, and so to overcrowd; and the 60 ft. by 15 ft. huts are therefore more often in excess of mobilization than their larger compeers.

Overcrowding influences the incidence of cerebro-spinal fever partly by its depressing effect, partly by shortening the distance between man and man, and so facilitating the transmission of infections of the upper respiratory organs, since the virus is sprayed into the surrounding air in droplets of secretion during coughing, sneezing, and loud speaking.

Thus overcrowding favours the occurrence not only of cerebro-spinal fever but also of its forerunners, the catarrhal diseases such as influenza, which so often precedes it, and it also promotes our sixth etiological factor —a high carrier rate of epidemic strains of the meningococcus.

The Close Relation between Overcrowding and Carrier Rate.

Were it not for differences in the efficiency of ventilation and for differences due to catarrhal diseases which increase the spraying range of the individual, the relation between the space separating the beds and the carrier rate of a unit would be almost a simple inverse ratio. In the last seventeen months I have examined 12,000 non-contacts largely in connexion with the question of overcrowding, and whilst I do not propose to weary the reader with endless tables, I shall try to summarize the results in as useful a form as possible. Some of the results are shown in detail in a special report to the Medical Research Committee, March 6th, 1918. The chief thing to remember is that efficient ventilation and space between the beds are the vital points; mere floor space and mere cubic space are not at all of the same importance.

Taking barrack-rooms and huts together, it was found that strict adherence to a mobilization standard usually gave a carrier rate of just under 10 per cent.—that is, those agglutinating with one or other of the standard type serums of Gordon. Epidemic meningococci only are counted.

This (with ordinary barrack ventilation always understood) means that a distance of about 1 ft. 4 in. between beds corresponds with a carrier rate of about 10 per cent. A very slight excess above "mobilization" very rapidly sent up the carrier rate to between 10 and 20 per cent. If the beds were closer than 1 ft., 20 per cent. was almost invariably found, and if the distance were under 9 in., 28 to 30 per cent. was usual. A "peace" standard of accommodation, unless there were some gross defect of ventilation, rarely yielded a carrier rate over 5 per cent.

It was noted also that if overcrowding occurred in a unit which had not previously been overcrowded, two things happened: First, a marked rise in the carrier rate occurred, usually within a fortnight, reaching its maximum about three weeks after the overcrowding began; this is termed the "warning rise," and when the other factors which have been enumerated were present, and the carrier rate reached 20 per cent., cases of the disease usually began to occur.

Secondly, the proportion of carriers of epidemic or agglutinable strains of the meningococcus to carriers of inagglutinable strains very markedly increased.

In every case the carrier rate of non-contacts of the same unit was approximately equal to the carrier rate of the actual contacts of the case.

Rise in Non-contact Carrier Rate a Storm Signal.

A sharp rise in the non-contact carrier rate to over 20 per cent. is as sure a storm signal of imminent trouble as it is a sign of overcrowding or dangerously deficient ventilation.

Whilst overcrowding produced a rise in the carrier rate very quickly, a return to mobilization standard was not sufficient to reduce the carrier rate markedly, but the carrier rate was reduced with remarkable success by spacing out the beds to 2½ ft. distance between each, although not at so fast a rate as overcrowding will raise it. To raise the carrier rate by overcrowding was both easier and quicker than to diminish it by spacing out.

Thus, a camp which had been purged by six months of spacing out, and which had a carrier rate for the month of March (1918) of 0.5 per cent., was severely overcrowded in April (beginning on April 20th). By May 2nd the carrier rate was over 30 per cent.

This camp forms so excellent an example of the effect of two periods of overcrowding alternated with a period of spacing out that I propose to outline its recent meningococcal history.

The sequence of events down to the end of November, 1917, has been described in a paper on the epidemic of cerebro-spinal fever of 1917 at X Dépôt,[1] but for convenience I shall briefly recapitulate the story from the beginning of the war.

The *first outbreak* was in January and February, 1915, and followed severe overcrowding. There were 19 cases, with 11 deaths. No information is obtainable as to carrier rates or as to the type of meningococcus infecting the patients.

The *second outbreak* began in February, 1916. Seven cases occurred, all due to meningococcus Type II. Only contacts were examined, but this was done on a very wide scale by Captain M. Flack, and in most cases the "contact" carrier rate was over 20 per cent. I have no information as to the overcrowding, but as the "mobilization" standard of each hut was taken as 32 instead of 30, it follows that each man had only 37.5 square feet of floor space, whilst, allowing for the stove, there would be almost exactly one foot between the beds. It is therefore certain that there was some overcrowding in 1916, though I am informed it was not nearly so severe as in the preceding or following years.

In August, 1916, Captain Flack commenced a series of observations on the carrier rate of non-contacts at the dépôt, which I have continued, so that for more than two years the carrier rate of the dépôt has been under continuous observation. Almost every week 100 men have been examined.

In August, 1916, the carrier rate was 10 per cent., that of October 6 per cent., November 4.6 per cent. Now began slight overcrowding, but not until December 1st, 1916, was the overcrowding severe. The carrier rate commenced to rise at once. On December 9th it was 17 per cent., on December 23rd 19 per cent., and on December 28th two cases of the disease occurred. At the end of January, 1917, a sharp outbreak of cases occurred. On January 27th the average carrier rate of the contacts was 60 per cent.; on February 5th both contacts and non-contacts showed carrier rates of over 70 per cent. The dépôt was now reduced to about nominal mobilization standard, but men were still thirty-two in each hut, and cases continued to occur until the end of March.

The great majority (70 per cent. at least) of both patients and carriers in 1917 were infected by meningococcus Type II. Twenty-one cases in all occurred in 1917.

Scheme of Prophylaxis.

In September, 1917, a scheme of prophylaxis was submitted to the D.D.M.S. after consultation with the commandant and the senior medical officer of the dépôt. Its

chief provision was the spacing out of all beds to 2½ ft. distance. This meant reducing the number of men in each hut from 32 to 23, thereby incidentally increasing each man's floor space from 37½ sq. ft. to 52; similarly it meant reducing the number of men in barrack-rooms from 36 to 26. This involved a reduction of 1,266 beds below the mobilization standard, the beds being returned to store. (It should be noted again that the mobilization standard had been erroneously calculated on a 32 bed per hut basis.)

The other provisions included simple devices for fixed (hopper) window ventilation, the postponement of anti-typhoid inoculation until the recruit's second month, provision of larger medical inspection premises, prevention of overcrowding in Y.M.C.A. and similar premises, and the provision of a large spray hut capable of treating two platoons simultaneously if necessary, and weekly samples of 100 men as a guide to the current carrier rate.[3]

I have no doubt that the spacing out was by far the most important, ventilation coming second, and probably the postponement of the inoculation (until the recruit is to some extent acclimatized) third. Spray treatment was used for entrant recruits only until May.

The scheme was to come into force if a warning rise occurred in the carrier rate, or at the beginning of the "danger period," that is, the winter months. The carrier rate, which had been low in August, 1917, showed a considerable rise in September, and on September 27th a sample of 100 trained soldiers (who are distributed two in each hut) gave a carrier rate of 17 per cent. Permission was then obtained to put the scheme into force, and "spacing out" was practically accomplished by October 4th, 1917.

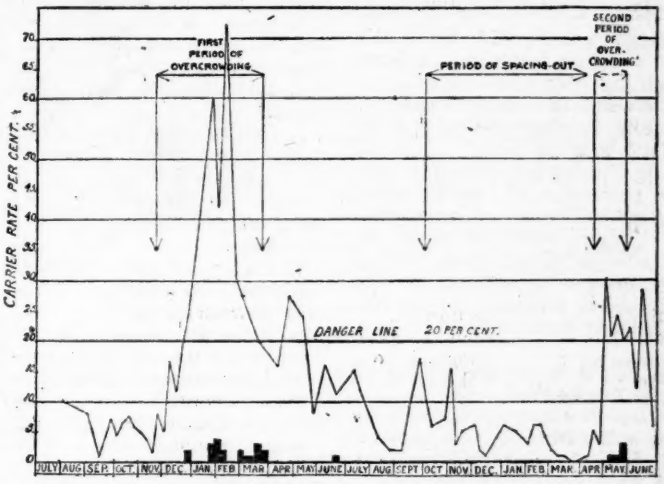

FIRST PERIOD OF OVERCROWDING
PERIOD OF SPACING-OUT
SECOND PERIOD OF OVER-CROWDING
CARRIER RATE PER CENT.
DANGER LINE 20 PER CENT.
JULY AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE

Chart showing effect of alternate overcrowding and spacing out upon case incidence and non-contact carrier rate of cerebro-spinal fever at X Dépôt. Line = weekly carrier rate. Columns = weekly incidence of cases.

The success of the scheme exceeded all expectations, the carrier rate fell steadily throughout the winter. The average for December, 1917, was 3 per cent., compared with 16 per cent. average for 1916. For January, 1918, it was 4 per cent., compared with 60 per cent. for January, 1917. For February, 1918, the average was 4 per cent., compared with the 72 maximum and 40 per cent. or over average for the February of 1916. For March, 1918, the average was 0.5 per cent., compared with 20 per cent. for March, 1917. This is only a quarter of what is usually regarded as the irreducible minimum of the civil population, 2 per cent.

For the first time in four years of war the winter months had passed not only without an outbreak, but without a single case of cerebro-spinal fever. Not only had the scheme done what was intended in the prevention of cases of cerebro-spinal fever and the elimination of carriers, but the dépôt had also been almost free from other infectious diseases, and had been extraordinarily healthy. That this was not entirely due to a favourable winter is shown not only by subsequent events, but also by the fact that another dépôt situated ten miles away, which was severely overcrowded, had a sharp outbreak of cerebro-spinal fever during January and February.

But perhaps the most striking proof of the efficacy of spacing out is furnished by the fact that when overcrowding again began, and cases and high carrier rates followed in its wake, the infection was due to a type of meningococcus other than Type II, to which had been due all the cases in 1916 as well as six-sevenths of the cases in 1917, and 70 per cent. of the carriers, as well as nearly all the cases in several subsidiary outbreaks in the reserve battalions fed by recruits from the dépôt. The house was indeed swept and garnished of its Type II infection, and when the overcrowding came again the devils, worse than the first, that entered in and abode there were Types I and III.

Recurrence of Overcrowding and of Carriers.

Spacing out came to an end on April 19th, 1918, after a reign of 198 days. Then came the great call up of previously exempted men, mostly miners. The dépôt authorities, particularly the senior medical officer, were fully alive to the dangers of overcrowding, and from the first made strenuous efforts to prevent it, but so fast did recruits pour in that extra accommodation in the shape of tents toiled painfully in the rear of the rapidly increasing strength of the garrison instead of anticipating it. Hundreds were continually arriving without notice, and had to be put in already overcrowded accommodation.

Overcrowding began on April 20th, and by April 25th it was extremely severe, worse than at any previous time, remaining very severe for three weeks. The carrier rate had been 1 per cent. on April 10th. On April 17th and 26th new arrivals only were examined, those on April 26th not having slept more than one night in the dépôt, showed 3 per cent.

A sample of 100 men on May 2nd, who had been some time in the dépôt, showed 31 per cent. carriers. The danger signal had indeed come, but the season was May, and it was hoped that this might avert an outbreak. On May 7th, however, the first case of the disease was diagnosed. One barrack-room on May 9th showed the high carrier rate of 41 per cent. On May 19th and the three following days four cases occurred, all, like the first, due to Type I meningococcus. On and after May 20th all men (about 4,000) who had been three weeks or more in garrison received a six days' course of spray treatment with a solution of zinc sulphate 1.2 per cent. in the spray hut, each man having ten minutes' treatment each day. A large sample of 375 of these men examined immediately after the conclusion of the six days' treatment showed an average carrier rate of 16 per cent., those from barrack-rooms being still well above 20 per cent. By May 25th, however, the accommodation allowed of a "mobilization" standard, and by June 8th tentage had been obtained sufficient to allow of the following modified spacing out: 7 men to each tent, 27 to each hut, and 30 to each barrack-room.

The carrier rates in the barrack-rooms remained high for some time, the overcrowding having been worst in them, but there were no further cases until after a severe epidemic of "Spanish" influenza in July, when two more cases occurred.

The events at this dépôt may be summarized in a few words, as follows:

1. "Spacing out" almost completely purged the dépôt of the previous Type II infection. (Spacing out, that is, to 2½ ft. between beds—that is, twenty-six beds in each barrack-room, twenty-three in each hut.)

2. Subsequent severe overcrowding raised the carrier rate to 30 per cent. in a fortnight, and in about three weeks was followed by a series of cases of the disease, although the usual danger season was well past.

This new infection was due to Type I in all cases, and the majority of carriers carried Type I or III instead of II as in the previous outbreaks.

3. The recruits entered with a low carrier rate, which multiplied rapidly in the overcrowded state of the garrison.

4. An extremely well marked rise in the carrier rate ("the warning rise") took place before the actual cases occurred.

5. The average "contact" carrier rate was substantially the same as the average "non-contact" carrier rate of the same period for the same class of accommodation.

6. A marked rise in the proportion of carriers of epidemic strains (that is, those agglutinating with the four standard serums of the Central Cerebro-spinal Fever Laboratory) to carriers of organisms culturally resembling the meningococcus, but not agglutinating, was found in the non-contact samples after the commencement of the overcrowding.

This increased proportion of agglutinable strains, which was also found in the 1917 epidemic period, constitutes a second danger signal. (See article previously cited.)

7. Cases ceased to occur as soon as the dépôt was spaced out to some extent (barrack-rooms 30, huts 27, tents 7 men in each) and carrier rates declined, those of the barrack-rooms remaining high for two months.

Effects of Spacing Out in Other Units.

The results of "spacing out" beds to 2½ ft. in other units were equally remarkable. The table gives the results in four instances with men sleeping in barrack-rooms all severely overcrowded when the men were first examined.

Effects of "Spacing Out" on "Severely Overcrowded" Barrack-rooms.

Unit.	Date of First Swabbing.	Percentage Carrier Rate before Spacing Out.	Period Spaced Out Approximately.	Date of Second Swabbing.	Percentage Carrier Rate after Spacing Out.
No. 1 ...	Sept. 29	22.0	8 weeks	Dec. 6	2.0
No. 2 ...	Oct. 2	28.0	6 weeks	Nov. 23	7.0
One room of No. 2	Oct. 2	38.5	6 weeks	Nov. 23	4.5
No. 4 ...	Oct. 26	28.0	5 weeks	Nov. 30	4.5

At the same time great attention was paid to the ventilation, which, particularly in the first instance, had been greatly interfered with by lighting restriction regulations. Other classes of accommodation, such as huts, Aylwin huts, and loose-boxes, yielded equally satisfactory results with spacing out, but details need not be given here.

The importance of reducing the carrier rate of a unit is not limited merely to the prevention of cerebro-spinal fever in the unit itself. A home unit with a high carrier rate involves the sending of highly infected drafts to transports and front line conditions where overcrowding is really inevitable. It also involves a certain, though small, number of cases occurring in civilians, usually the soldier's children, from infection by carriers returning on leave.

There are several practical points in the prevention of cerebro-spinal fever that I have not touched upon.

First, the well known fact that it is recruits in the first months of service who chiefly suffer from the incidence of the disease, would seem to indicate that this class of soldier should be protected by special "spacing out" (preferably to the full "peace standard") during the winter months, at any rate for his first three months of service.

Secondly, corners of rooms and huts are usually found to have carriers sleeping in them; this is no doubt due to "dead end" ventilation. Partitions in huts (such as occur in a well known naval pattern) and barrack-rooms are therefore injurious, as they double the number of corners beside interfering with ventilation generally.

Thirdly, small subdivisions of a unit's sleeping accommodation, such as occur with tents or Aylwin huts or loose-boxes, limit infection, but at the same time focus it. A sample of 100 men in crowded Aylwin huts, for example, gave an average carrier rate of 15 per cent., whilst one hut in the sample had a 50 per cent. rate.

GENERAL CONCLUSIONS.

1. A high carrier rate usually denotes overcrowding and dangerously unhygienic conditions, even though no cases of the disease may have recently occurred.

2. Whilst sporadic cases may occur in a military as in any other community with any carrier rate, anything approaching an epidemic of cerebro-spinal fever is heralded by a warning rise of considerable height in the carrier rate.

3. Severe overcrowding will probably be accompanied by a carrier rate (serological) of at least 20 per cent. This percentage is indicated as the danger line in the War Office *Memorandum* on cerebro-spinal fever (March, 1917). A carrier rate of this height will usually imply that the mobilization standard of 40 sq. ft. per man has been infringed, and that beds in the unit examined are less than 1 ft. apart. It should be regarded as a signal for prompt and effective action to diminish overcrowding, and to improve ventilation.

4. The distance between beds is of paramount importance.

5. Carrier rates between 10 and 20 per cent. are unsatisfactory, and imply a certain amount of overcrowding; they must be watched with suspicion.

6. Carrier rates from 2 to 5 per cent. may be considered usual under the best conditions obtainable in barracks and hutments.

7. Under the same conditions of overcrowding ("no-contacts") carrier rates agree substantially with "contact" carrier rates.

8. Quite a moderate degree of "spacing out" of beds, combined with simple methods for improving ventilation, are highly efficient agents in reducing high carrier rates.

9. When a unit shows a high carrier rate, a distance of at least 2½ ft. between the beds should be enforced. The "peace" standard would, of course, be even more effective.

10. Recruits should be specially spaced out during their first three months of service.

REFERENCES.

[1] *R.A.M.C. Journal*, January, 1918; *Journal of Hygiene*, July, 1918.
[2] For details see the article previously quoted, *R.A.M.C. Journal*, January, 1918.

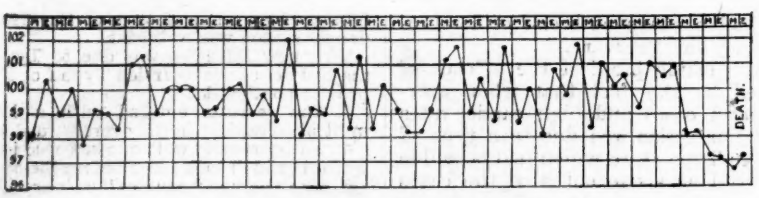
A CASE OF SUBACUTE INFECTIVE ENDOCARDITIS.

BY

BERNARD HUDSON, M.D.CANTAB., M.R.C.P.,

MAJOR R.A.M.C.(T.C.).

HAVING read with great interest the paper by Lieutenant H. J. Starling, R.A.M.C., on five cases of subacute bacterial endocarditis, reported in the issue of the BRITISH MEDICAL JOURNAL for August 17th, I am tempted to give an account of a case of endocarditis of great interest which has recently been under my observation in No. 2 Red Cross Hospital, France.



The patient, a man aged 40, died eight weeks after admission to hospital. He was sent with a diagnosis of "endocarditis." On admission he was pale, somewhat wasted, and in a typical "typhoid" condition, drowsy, and of slow mentality.

There was no history of previous rheumatic fever or any other disease. He stated that he was perfectly well till about five weeks previously, when he commenced to get severe headaches, malaise, and was very easily fatigued. There is no previous record of his temperature or cardiac condition.

On examination the apex beat was not displaced, nor was there any obvious enlargement of the heart. On auscultation a loud diastolic murmur was heard, conducted up the sternum to the aortic valve. There was also an apical systolic murmur. The pulse was 80, and of distinct water-hammer type. There was nothing abnormal in the chest or the abdomen. The spleen could not be felt. The patient was covered with an eruption of small petechial spots, which kept coming out in crops throughout the course of the disease.

A copy of the temperature chart is attached.

The urine contained a slight cloud of albumin, but otherwise presented nothing of special importance. Cultures made from the blood on several occasions were always sterile. A blood count was done many times, but there was never any leucocytosis, the number of white cells being between 7,000 and 8,000.

For treatment, courses of anti-streptococcic serum and also vaccines were tried, but with no effect whatever. The course of the case was extremely slow, and the patient almost imperceptibly went downhill. The cardiac murmurs kept changing in quality throughout the disease, but the heart never became enlarged, and the apex beat all through remained in its normal position; the pulse was slow and regular throughout, and preserved its aortic quality.

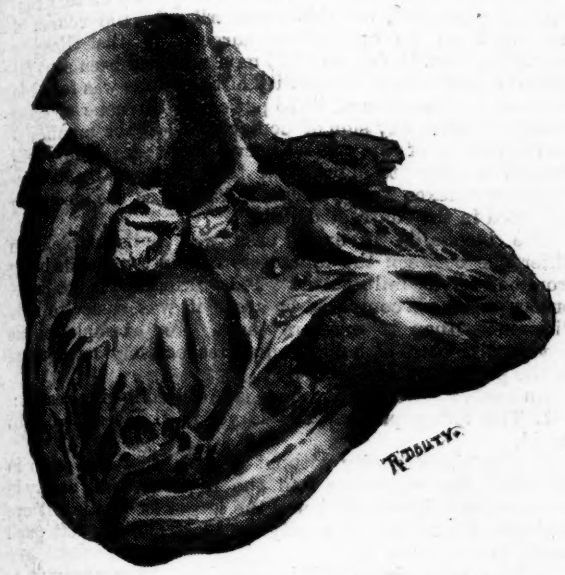
The patient gradually became more and more toxaemic, and finally died eight weeks after admission.

Post-mortem Examination.

The heart was not enlarged, nor was there any degree of myocardial degeneration. A large cauliflower-like vegetation was found on one cusp of the aortic valve, almost completely closing the orifice of the valve. There was a similar vegetation on the adjoining cusp; the third cusp was free. The summit of the large vegetation was soft and friable, but the base was cartilaginous. The mitral valve had two or three similar but smaller vegetations on it. The right side of the heart was normal.

The spleen was dark, about twice its usual size, and showed two recent infarcts. There were also small infarcts in each kidney, but the rest of the examination showed nothing abnormal.

In a smear made from the aortic vegetation were seen enormous numbers of organisms resembling streptococci, rather large in size, and growing in chains of three to five.



Drawing of interior of left side of heart.

The remarkable features about this case were the insidious and slow progress, the absence of any definite cardiac symptoms, and the fact that the heart never became enlarged, in spite of the severity of the aortic lesion and the long duration of the case. This may be attributed to the fact that the large vegetation prevented any real leaking of this valve.

The patient was never really "cardiac"; there was no dyspnoea or oedema, and the pulse maintained a steady, regular, slow beat till the end. He was in a "typhoid" state throughout the disease, and died eventually of a slow toxaemia.

A CASE OF INTESTINAL OBSTRUCTION.

BY

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AND

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THE case here reported was evidently an instance of intestinal obstruction due to the healing process of old tuberculous ulcers of the bowel, possibly secondary to a lung infection.

John S., aged 68 years, was admitted to the Ashton-under-Lyne Infirmary on April 16th, 1918, having been sent in by Dr. Macintyre on account of abdominal pain and distension accompanied by vomiting. At 16 years of age he had "slow fever," and at 25 years had "inflammation of the bowels." He stated that with the exception of these illnesses he had always been a healthy man, and up to three months ago had never had any digestive troubles. The bowels had always acted regularly without aperients.

Three months before admission he began to be troubled with "pain in the stomach," the pain being chiefly located in the epigastrium. Usually it came on suddenly within half an hour after taking food, and ceased suddenly. He vomited occasionally and this relieved the pain; the vomit was "very acid." His appetite had fallen off, and he had lost flesh considerably. The family history was unimportant.

The abdomen was greatly distended and the percussion note tympanitic all over. The liver dullness was normal. On palpation strong peristaltic waves could be set up, causing the intestines to stand out in well marked relief in transverse bands running obliquely downwards from left to right in the umbilical and hypogastric regions, the so-called "ladder phenomenon." There was also marked gurgling on palpation of the descending colon. No tumour was palpable. Though tenderness was general, it was most marked over the epigastrium. The heart and lungs were normal; temperature 98°, pulse 98, respirations 24.

Blood Count.

Erythrocytes	4,664,000
Haemoglobin value	65 per cent.
Colour index	0.7
Leucocytes	12,000
Eosinophils	0 per cent.
Polymorphs	74 ,,
Lymphocytes	18 ,,
Large mononuclears	2 ,,
Transitionals	6 ,,
Mast cells	0 ,,

Total non-protein nitrogen, 95 mg. per 100 c.cm.

The urine contained a trace of albumin and a few granular casts; indican was present in marked excess.

X-ray Report.

The *x*-ray examination showed the stomach to be of a partial hour-glass form. The bismuth meal passed freely into and through the duodenum and jejunum, but was obstructed in the ileum, from which it passed slowly into the caecum. The radiogram shows the small intestines filled with the bismuth meal, portions of the intestines being ballooned out with gas. The *x*-ray diagnosis was "obstruction in the lower part of the ileum."

The bowels acted naturally once or twice daily. The vomiting persisted and the pain increased, so that it became necessary to administer morphine. On the evening of April 15th, his general condition being satisfactory enough to warrant it, it was decided to open the abdomen in order to relieve the obstruction. The diagnosis before operation was obstruction in the ileum or at the caecum, probably due to a malignant growth.

Operation.

The abdomen was opened by a right paracentral incision through the rectus. Numerous loops of distended small intestine immediately protruded through the wound. A rapid examination only was permissible on account of the general condition. No definite tumour or band or other cause of obstruction was found. A Paul's tube was inserted high up in the ileum, drainage being free through the tube.

The day following the operation the patient's general condition improved and the vomiting ceased, but from then onwards he became gradually weaker and died on the third day.

Post-mortem Examination.

This was performed twenty-four hours later. Emaciation was not marked. There were very few adhesions at the site of the wound and little shutting off of the abdominal cavity. There was no definite tumour palpable, but at intervals along the small intestines at the attachment of the mesentery could be felt small hard masses. The largest mass, however, was situated in the descending colon just above the sigmoid, and this would probably have been palpable during life but for the general distension. On removal of the small intestine it was found that at a point 77 in. above the caecum there was extreme stenosis, the lumen of the bowel being contracted to a size sufficient only to admit a wooden match. The stenosis was due evidently to scar tissue formation consequent on a previous ulceration of the bowel, the scarring spreading pincer-wise, with much thickening at the attachment of the mesentery. The bowel above the obstruction was ballooned and its wall markedly hypertrophied. There were no stercoral ulcers—"distension ulcers of Kocher"—present. The peritoneal surface of the intestine in the neighbourhood of the stenotic areas showed numerous yellowish plaques. Between this main obstruction and the caecum there were three similar lesions of varying degrees of stenosis, and in one instance evidence of an old ulcer was distinctly visible on the interior of the bowel by an oval depressed scar with its main axis transverse. A similar condition also existed at a point in the descending colon, just above the sigmoid flexure, but here the thickening and scar formation was much more pronounced. The peritoneal surface of the bowel showed patches of pigmentation. It was not possible to remove the stomach in the usual way as its posterior wall was firmly adherent to the subjacent structures, and after removal by dissection it was found that there was an old healed ulcer which had given rise to much thickening and contraction of the posterior wall and a mild grade of hour-glass stomach. The mesenteric glands were enlarged and one or two showed calcification changes. The

lungs showed at both apices old healed scars. The left base had firm, tough adhesions. The other organs showed nothing abnormal. Histologically the appearance of the lung sections were those of old healed tuberculosis. Sections of the bowel made at the site of stenosis showed thickening of the muscular layers and particularly of the submucosa, with proliferation of fibroblasts. The mucous membrane was in an atrophic condition. Sections from different points stained for tubercle bacilli were all negative.

The points of interest in this case are the length of time elapsing between the primary attack, forty years previously, and the shortness of the period—three months—during which the patient showed symptoms and was extremely ill. This is assuming that the history of "inflammation of the bowels" at the age of 25 was the primary attack of intestinal tuberculosis, and the details he gave of the illness give weight to this assumption, which is further supported by his claim to have enjoyed good health without a break up to the time when his final illness began. Excluding strictures of the rectum, obstruction of the bowel due to cicatricial contraction is a rare condition. A series of 70 cases has been collected (Bernay), and over a period of thirteen years the percentage of cases of cicatricial stenosis causing obstruction was 1.8 out of 669 cases at the London Hospital. According to Nothnagel, the only common causes are tuberculous and stercoral ulcers, but typhoid, dysenteric, duodenal and syphilitic ulceration may be followed by cicatricial stenosis. Tuberculous ulcers usually give rise to multiple stenoses, and in one case described by Nothnagel there were seven stenotic cicatrices.

PYLORIC STENOSIS WITH ACCOMPANYING SPASMODIC DYSPHAGIA.

BY

CAPTAIN E. B. BARTON, M.B., CH.B., R.A.M.C.,

AND

LIEUT.-COLONEL H. H. C. DENT, M.B., F.R.C.S.,

L.R.C.P., R.A.M.C.(T.F.).

THE following case of pyloric stenosis presented considerable interest on account of an accompanying difficulty and pain in deglutition.

J. W. S., aged 36, previously in excellent health, developed gastric symptoms in August, 1916. He was treated in a military hospital from September 11th to November 10th, 1916, for dilatation of the stomach. At that time he had increasing dysphagia. In December, 1916, on two occasions attempts were made to pass oesophageal bougies. Finally he was informed that he had an oesophageal stricture.

Up to July, 1918, he was in a low category. He had lived on bovril, milk, and slops only, as he was unable to swallow anything solid. He was then admitted to the Clipstone Military Hospital in a very debilitated condition. He complained of marked dysphagia, gastric distension and vomiting. The dysphagia had been constantly present since 1916, but was apparently not progressive. There was no regurgitation of food from the oesophagus. Regularly every two or three days he vomited a large quantity of fluid and mucus, sometimes streaked with blood.

A bismuth meal was given and the passage of the bismuth observed with the screen and the *x* rays. There was a distinct check in the forward peristaltic contraction of the phreno-cardiac portion of the oesophagus. The examination was repeated and the check appeared at a different level. There was very marked gastric delay. Bismuth still remained in the stomach after thirty-six hours. The opinion was formed that the condition was one of duodenal ulcer with pyloric stenosis and a reflex spasmodic stricture of the oesophagus.

On September 4th laparotomy was performed by a paracentral incision. The stomach was found very much dilated. The cardiac end was normal. The pylorus was obstructed by a thick fibrous ring which was almost impermeable. Over this ring was a puckered scar suggesting an old duodenal ulcer. Posterior gastro-jejunostomy was performed, an opening being made 2½ in. in length in the stomach and in the jejunum.

He stood the operation well and had hardly any post-operative sickness. He was soon on solid food, and, although the first mouthful causes slight difficulty in swallowing, yet he can eat a full meal with ease. He was up in three weeks. His weight was 8 st. 3 lb. before operation; now (October 10th) it is 8 st. 13 lb. He looks and feels an entirely different man. *X*-ray examination shows normal swallowing.

INEQUALITY OF THE PUPILS.

BY

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GLASGOW.

THE question of the meaning of inequality of the pupils is always being raised for diagnostic purposes, especially in affections of the thorax. According to many authorities "inequality of the pupils is always pathological";[1] but many observers are not so dogmatic, and admit that the condition occurs in from 1 to 10 per cent. of all cases.[2]

In order to gain some idea of the frequency of this condition I examined, for this peculiarity, in the course of my work as an ophthalmic surgeon in the Glasgow recruiting area, the eyes of 326 men who had been sent for special examination. Inequality of the pupils was found in 35 cases, a proportion of 10.73 per cent. In none of these cases was there any sign of ocular disease nor manifestation of disease of the central nervous system. The pupils reacted readily to light, and the consensual and convergence reflexes were normal; in each case the inequality persisted in the contracted state.

The inequality in every case was indisputable, the difference between the diameters of the two pupils being from one to two millimetres. This difference is not large, but as pupils are compared by areas it was easier to note differences than to measure them. For example, pupils having diameters of 3 and 2 mm. respectively have areas in the proportion of 9 and 4.

An analysis of these 35 cases gave the following results:

1. The left pupil was the larger in 21 cases, the right in 14.

2. The visual acuity without glasses was the same in 10 cases; the right eye had the higher visual acuity in 8 cases, the right pupil being the larger in 4; the left eye had the higher visual acuity in 17 cases, the left pupil being the larger in 13.

3. The refractive condition of the 35 cases was as follows:

Emmetropia	2
Hypermetropia	2
Hypermetropic astigmatism	2
Myopia	11
Compound myopic astigmatism	1
Mixed astigmatism	3
Anisometropia	9
Not recorded	5

The conclusions which may be drawn from this investigation are as follows:

1. Inequality of the pupils is frequent.

2. It is associated with all refractive conditions, with a tendency to be more frequent in myopic conditions.

3. The visual acuity is not affected adversely by the fact that one pupil is slightly larger than the other.

4. The left pupil is more frequently larger than the right.

5. Inequality of the pupils occurs as a physiological condition.

REFERENCES.

[1] Fuchs, *Textbook of Ophthalmology*, fourth edition. [2] Hawthorne, *Clinical Medicine*.

THE Italian Minister of Finance has set up a committee consisting of the deputies Sanarelli, Maggiorino Ferraris, Rava, Landucci, and Belotti, Professors Flora, Vinaj, and others, with the Under Secretary of State as chairman, to investigate and report on the watering places and thermal springs of Italy, and the means of developing their usefulness and increasing their value.

WITH the object of preventing the evils due to the excessively high prices of medicines in Italy, powers have been given to prefects, on the representation of the provincial health council, to fix a maximum price for drugs in most common use. Contravention of this ordinance is punishable by fine up to £40; for a repetition of the offence the penalty is imprisonment up to the term of one year. The shop of the offending pharmacist may be closed temporarily, or in case of repetition permanently, by decree of the prefect.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ANTISTREPTOCOCCUS SERUM IN INFLUENZA.

During the month of October, 1918, 26 cases of pneumonia were admitted to my wards at the Bristol Royal Infirmary. Of these, 13 died and 13 recovered.

During the same period of time 53 + 15 cases of influenza, without any pulmonary lesion, were also admitted. Of the first 53 cases 40 recovered after a simple fever, 3 died without any pulmonary lesion, and 10 developed pneumonia, of whom 6 died and 4 recovered; 23 of these were treated by a vaccine (in doses of from 5 to 30 million) prepared from a *Micrococcus epidemicus* isolated by my colleague Professor Walker Hall, but with no diminution either of the average length of fever or of the liability to pneumonia.

To the last 15 cases antistreptococcic serum was given by hypodermic injection. All recovered, and no pneumonia occurred in any. In many cases a fall of temperature to normal, or but little above, occurred after one dose, in some after two daily doses, whilst in one case three doses were necessary.

The numbers are too few for definite conclusions, but, taken in association with the statement in your editorial article on the etiology of influenza that the organisms "chiefly responsible for the gravity of the secondary pulmonary complications are pneumococci and streptococci," they suggest the advisability of giving antistreptococcic serum in 10 c.cm. doses to all cases of influenza where a high temperature persists into the second day, and of repeating it if necessary in the hope of preventing the occurrence of pneumonia.

I should add that I have not had any good results from the serum in four cases where pneumonia had already developed.

Clifton. F. H. Edgeworth.

HAEMORRHAGE IN INFLUENZA.

In the pandemic which is at present raging the great frequency of haemorrhage from mucous surfaces has been observed by me. Epistaxis is very common in children and adolescents.

Haematemesis is frequent in those cases in which vomiting occurs. Haemoptysis is present in the pneumonic stage, but I have found it in four individuals in whom there was no pneumonia, and all of whom were up and out in a week.

More interesting still is the fact that young girls menstruate before their time, and girls who have never menstruated commence that function during an attack. Women miscarry in many cases, and I have notes of one woman who had a premature infant.

Lastly, I may mention the instance of a married lady who was operated on for uterine carcinoma two years ago. There has been no haemorrhage since until this week, when, in the course of an attack of influenza, violent and alarming bleeding occurred.

John A. McConnochie, M.B., Ch.B.Glasg.

Glasgow.

DEFLUVIUM CAPILLORUM AFTER INFLUENZA.

Dr. Robert Gibson (British Medical Journal, October 26th) puts the time of occurrence of defluvium as two to three months after the influenza. A patient of mine suffering with influenza at the present time gives a very definite history of a severe previous attack of the same complaint nine years ago, when he was 44 years old, in which his hair began to come out in large quantities whilst he was still in bed about ten days after he had been taken ill; the loss of hair continued during convalescence, and in spite of treatment at the time and subsequently, the hair has never grown again, and he is nearly bald at the present moment.

Cinderford, Glos. John N. Beadles, M.B., B.S.Lond.

THE ADMINISTRATION OF ANAESTHETICS TO SOLDIERS.

Two communications have lately appeared in the Journal under the above heading, each recommending some form of apparatus. I wish to express my conviction, founded on experience since the beginning of the war, that (except when nitrous oxide is required, or when for nose and throat cases a Junker must be used) no apparatus whatever is necessary or desirable beyond a Schimmelbusch mask with two layers of domette. Three drop-bottles, preferably Hewitt's tap pattern, should be at hand, filled respectively with C.E. mixture, ether, and chloroform; and a tube of ethyl chloride may be added. The administration begins with C.E. given slowly at first, and, if rapid loss of consciousness is desired, a little ethyl chloride may be sprayed on the wet mask. Generally the C.E. is continued throughout, changing to ether if stimulation is needed, and to chloroform in opposite circumstances. Chloroform is generally best towards the end of a long operation.

Eastbourne. H. S. Gabbett, M.D.

ROSACEA SUCCESSFULLY TREATED BY MIXED STAPHYLOCOCCUS VACCINE.

Rosacea, according to Dr. Norman Walker, consists clinically of an inflammation of the skin—a dermatitis which culminates at certain points in the development of small pustules, although these are not invariably present, as in some cases the dermatitis does not go beyond the papular stage. It affects especially the forehead, nose, cheeks, and chin. The hyperaemia keeps the skin in a constant state of hypernutrition, leading to the development of increased fibrous tissues, evident in the milder cases as simple thickening and in the more severe as those hypertrophic pendulous masses which go by the name of rhinophyma or potato nose.

M. F., a man of temperate habits, came under my care in January, 1918, with what clinically answered this description of rosacea in a somewhat mild form, but nevertheless very intractable, as it had lasted over nine years. The nose, chin, and cheeks were affected. I examined the scalp carefully, but failed to detect any sign of seborrhoea or other irritation which might have brought on this condition. I prescribed an ointment and advised careful attention of the scalp, but the patient begged me to adopt a different line of treatment, as he had been given such remedies elsewhere for years without effect. I thought it worth while to try vaccine treatment, and gave an initial dose of 250 million mixed staphylococcus vaccine. This immediately brought on a reaction, with marked accentuation of the local lesion. The vaccine was pushed, and doses of 500 million organisms were given at weekly intervals for the next five weeks, and during this period the patient made marked progress. Six doses of 1,000 million organisms followed by two of 2,000 million were then administered; at the end (April) the last trace of the lesion had disappeared, and the patient has not at the time of writing (October) had any sign of recurrence. Without presuming to explain the action of the vaccine, I feel justified in attributing the favourable results to its administration.

Leicester. P. W. Lam, M.D.Edin.

Reviews.

THE TREATMENT OF HYSTERIA.

It is probable that no branch of medicine will be affected more greatly for good by the war than that concerned with the non-organic nervous disorders. A great work is being done in the elucidation of the nature of these conditions here and there throughout the country, and by no one more successfully than by Major A. F. Hurst and his co-workers, formerly at Netley and now at the Seale Hayne Military Hospital in Devonshire. Certain aspects of the diagnosis and treatment of non-organic nervous disorders are dealt with fully in a new periodical, *Seale Hayne Neurological Studies*,[1] the first number of which has lately been received. It contains a series of short, practical, and essentially readable papers on various manifestations of hysteria, on the rapid cure of hysterical symptoms and on varieties of war contractures.

The articles embody the results of a large series of investigations rather than the notes of individual cases,

[1] *Seale Hayne Neurological Studies.* Edited by Major A. F. Hurst, R.A.M.C., assisted by Captains J. L. M. Symns and Reynell and Lieutenant S. H. Wilkinson. Vol. I. No. 1. Published every two months by the Oxford University Press. (Pp. 52. Price 3s. 6d. net. Annual subscription 1 guinea.)

and in this way standards of normality, as well as of abnormality, are fixed anew. The war has proved that several points in neurological diagnosis hitherto accepted require revision. This appears to be true especially of the so-called hysterical stigmata. It may be said that in no department of medicine is disease so ineffectively treated as is hysteria. Not every one is able to recognize the condition, and many of those who have an acquaintance with it are content to diagnose it without treating it. Of these the majority do not know how to treat it, either through lack of instruction as students, or, commonly, because at bottom they are unable to declare to themselves with sufficient conviction that no organic disease exists in the case. The surgical, orthopaedic, and electro-therapeutic departments of most hospitals continue to accept many patients who, owing to the misguided solicitude of their medical officers and their failure to effect a cure, are being taught to believe that their disabilities are incurable.

The successful treatment of a hysteric demands the power of making a correct diagnosis and an unconquerable will to cure. This last is bred from self-confidence. It is to be hoped that in the future more medical officers will seek the collaboration of the neurologist in the treatment of nervous cases which do not rapidly improve, and that they will seek this help early and thus save time all round. For instance, electrical reactions are tested daily in the case of muscles which are obviously normal, and unwieldy splints are still applied whose only function is to perpetuate his disability in the patient's mind.

In a patient recently under treatment, who was cured in thirty seconds, faradic massage to the outside of an aphonic larynx had been ordered by the doctor and had been applied daily by a masseuse for six months without the doctor having once witnessed the treatment. Such instances could be multiplied indefinitely, and it seems desirable to point the urgent need for improvement in the general knowledge of the diagnosis and treatment of hysterical disorders.

The new periodical edited by Major Hurst has only to be known to be assured of a wide circulation. The papers in the first number deal with neurological topics in a way which is attractive to members of every branch of the profession, whether specialist or non-specialist, and they will stimulate interest in hysterical disorders and arouse the will in many to know more about their diagnosis and treatment.—H. C.

SUSPENSION IN THE TREATMENT OF FRACTURES.

THE principle of suspension in the treatment of fractures, credit for which ought to be given to Hodgen, has obtained wide practical development during the war. Major Sinclair's name has rightly come to be associated with these developments in our own army, but progress has been the outcome of many independent efforts.

The French have not been slow to adopt and adapt the method, which MM. P. DESFOSSES and CHARLES-ROBERT describe with admirable lucidity and invaluable minuteness in a recent addition to the Collection Horizon.[2] For the moment their book holds the field and should prove very useful to the many surgeons who will have to familiarize themselves with every detail in order to carry out the systematic employment of the method that is to become the routine in all military hospitals.

If there be one department of civil practice which will receive permanent benefit from the experience of war surgery it will be the treatment of fractures. This book ought, then, to be very widely read; not least because it is admirably illustrated.

NOTES ON BOOKS.

A NEW edition of the handbook on *The Treatment of War Wounds*,[3] by Dr. W. W. KEEN, Emeritus Professor of Surgery in the Jefferson Medical College, Philadelphia, has appeared. As the first was published less than a year ago, the book has evidently been found useful by surgeons. The author observes in his preface that the rapid progress made in the treatment of war wounds through clinical observation, and more especially by the active research work at the front, as well as at base hospitals and laboratories in England, France, and the United States, has been such that this new edition is almost a new book. The chapter on shock has been expanded, and there is a full discussion of the treatment of fractures and of wounds of the head and chest. A useful feature of the book is that Major Keen has appended to many of the chapters a short bibliography of recent literature. We are sure that this second edition will meet with the same success as the first.

To a series of small books published under the general title, *Harvard Health Talks*, Dr. A. COOLIDGE, Professor of Laryngology in Harvard University, has contributed an essay on *Adenoids and Tonsils*.[4] He begins with a short account of the anatomy, in which he describes the tonsillar ring of adenoid or gland-like tissue in the mucous membrane collected especially at the top of the back wall of the naso-pharynx (the pharyngeal tonsil or adenoid), at the sides between the pillars of the palate (the faucial tonsils), and at the lower part of the front wall at the base of the tongue (the lingual tonsil). Then follows a description of the principal function of the tonsillar ring; summarizing the conclusions on this part of the matter, he says that the term "adenoids means a disturbance of the adenoid gland, generally an enlargement, but sometimes a disease of the tissue." Summing the matter up, he states that an adenoid in children and tonsils through life are normal parts of the body, but that sometimes they go wrong in one way or another, and then cause trouble, which may be slight or serious. His advice is that adenoids should be operated upon if they are causing a child persistently to breathe through the mouth, or any more serious symptoms, and that tonsils should not be removed for trivial reasons. "With both adenoids and tonsils we are dealing with structures which are normal parts of the body, and probably serve a useful purpose, and we should therefore spare them, unless we have reason to suspect that they are doing harm which outweighs their usefulness, and which warrants the slight dangers which must always be present in any operation."

The twenty-seventh edition of the *Annual Charities Register and Digest*[5] is much smaller than its immediate predecessors, owing, no doubt, to restrictions upon the supply of paper. The introduction by Sir C. S. Loch, on "How to help cases of distress," which has been a valuable feature for a number of years past, is omitted, together with the short prefatory articles on special branches of charitable work; and the survey of the past year has been cut down to a brief review of the finance of institutions. In other respects the volume shows little change in arrangement or scope. It will be found of the utmost value to all who need information as to the various agencies for the prevention and relief of distress and guidance in dealing with individual cases. The full table of contents and the elaborate index again add much to the usefulness of this indispensable reference book.

The most recent contribution of Dr. CABANÈS[6] to the byways of history is a collection of essays about the rheumatism for which Mme. de Sévigné went to Vichy and Bourbon l'Archambault; about the last illness of Pascal; about the eccentricities of Christina of Sweden; about the tragic fate of Struensée; and about the opinions of Rousseau and Diderot on the medical faculty, and so on. The essays are written with the author's customary ease, and contain many evidences of his curious erudition. As is his custom, he has illustrated the volume with reproductions of old prints and portraits.

Dr. JAMIESON HURRY'S contributions to the subject of "vicious circles in disease" have been noticed on various occasions in these columns. He has now republished in pamphlet form a short article on *Veterinary Diseases and the "Vicious Circle,"*[7] which appeared last summer in the *Veterinary News*.

[2] *La Suspension dans le Traitement des Fractures.* By P. Desfosses et Charles-Robert. Collection Horizon. Paris: Masson et Cie. 1918. (Cr. 8vo, pp. 172; illustrated. Fr. 4.)

[3] *The Treatment of War Wounds.* By W. W. Keen, M.D., LL.D. Second edition, reset. Philadelphia and London: W. B. Saunders Company. 1918. (Post 8vo, pp. 276. 8s. 5d.)

[4] *Adenoids and Tonsils.* By Dr. A. Coolidge. Harvard University Press. (Fcap. 8vo, pp. 46; 5 figures. 2s. 6d.)

[5] *The Annual Charities Register and Digest.* A classified register of charities in or available for the metropolis. Twenty-seventh edition. London: Longmans, Green, and Co., and Charity Organisation Society. 1918. (Med. 8vo, pp. 614. 5s. net.)

[6] *Légendes et curiosités de l'histoire.* Quatrième Série. Paris: Albin Michel. (8vo, pp. 342. Fr. 3.50.)

[7] *Veterinary Diseases and the "Vicious Circle."* By Jamieson B. Hurry, M.A., M.D. London: Baillière, Tindall, and Cox. 1918.

MEDICAL AND SURGICAL APPLIANCES.

THE ADMINISTRATION OF OXYGEN.

MUCH uncertainty has been introduced into the estimate of the therapeutic value of oxygen by the use of improvised methods which were not only wasteful but ineffective. It has sometimes been given through a funnel placed over the mouth, or even by simply allowing the oxygen to blow off in front of the nose and mouth. With these methods most of the oxygen is certainly wasted. The report of the Chemical Warfare Medical Committee on the administration of oxygen in irritant gas poisoning, to which reference is made elsewhere (p. 520), contains a discussion of the principles which should be observed and a description of apparatus for carrying them out. It is necessary to have on the cylinder a pressure gauge to tell how much oxygen is present in the cylinder, and a reducing valve to reduce the pressure and to maintain it constant till the cylinder becomes almost empty. The Haldane apparatus (made by Siebe, Gorman and Co., London, E.), designed to meet the requirements, is now in common use in the British and American armies. Originally it was made for one patient, but on the suggestion of Lieut.-Colonel Douglas a new pattern has been designed which enables two or four patients to be treated at one time. The oxygen is supplied to a metal facepiece, fitted round the rim with a soft pneumatic cushion of rubber, and tied over the patient's mouth and nose. The patient can at all times breathe in and out freely through an indiarubber flow valve, which produces a slight, but subjectively inappreciable, resistance to the air flow. The oxygen enters the face-piece during inspiration by a wide opening through a broad and flexible concertina tubing connected with an indiarubber bag on the cylinder. Oxygen flows in a steady stream into this bag, which is emptied at each inspiration. Expired air is prevented from passing back into the bag by a valve. The supply of oxygen is regulated by a valve provided with a graduated milled head, allowing from one to ten litres a minute to be given. In another form (the Salvox) only the gauge and reducing valve are on the cylinder, and the oxygen is led to the patient's bed by ordinary narrow tubing. The regulating tap and a small valve metre on which the flow of oxygen can be directly read off at any moment are fixed to a small board above the bed. A light portable apparatus has been designed for use on a stretcher. Leakage should be searched for with a glowing match, or by painting soap solution over any suspected part, when bubbles will show the leak. It is unsafe to use oil or grease on any part exposed to high pressure oxygen. If the patient is at first intolerant of the mask he can be accustomed to it by holding it just free of the face for a short time, until he begins to appreciate the benefit of the oxygen. In cases of pneumonia from any cause oxygen properly administered has been found of great value, and there is a considerable amount of evidence that it relieves or prevents the occurrence of adverse cardiac signs. It is essential that during the critical period oxygen should be used constantly and in sufficient quantity to remove the cyanosis if possible.

A PORTABLE SALVARSAN OUTFIT.

Brevet-Colonel L. W. HARRISON, R.A.M.C. (Rochester Row Hospital), writes: For the administration of "606" outside an institution where this work is routine the usual apparatus is rather inconvenient, being bulky and difficult to pack into a handbag. In addition to these disadvantages the setting up of the apparatus usually takes an amount of time which cannot well be spared, and for casual work of the kind mentioned the surgeon is apt to prefer "914," which can be given with a Record syringe, but, given intravenously, is not so permanent in its effects. In order to overcome these disadvantages I suggested to the Holborn Surgical Instrument Company that the apparatus could be made much more portable on the lines suggested in Fig. 1. They have perfected the idea, and added a compact case of articles necessary to the preparation of "606," so that the whole outfit is now contained in two boxes, which can easily be slipped into an ordinary surgical bag, and set up at the bedside in a few minutes. Fig. 1 shows a "606" and saline funnel, such as is used in military hospitals, suspended on a frame carried on a telescopic stand, which is screwed into the hinged end of the box. The funnels are set up at home, with the straining gauze in position at the top of each and the rubber tubing attached. The stand is collapsed and the whole turned into the box, which is closed and sterilized in a steamer. At the bedside the box is opened, and its hinged end carrying the apparatus turned down and fixed in position by two sliding bars in the bottom of the box. The telescopic stand is then extended to its full length, and the apparatus is ready. The other box contains three Soxhlet bottles of 250 c.cm. capacity, fitted with Eyre's special rubber caps, which are designed to permit of sterilization without the necessity of opening and closing the bottle—one of the bottles is graduated and is used for mixing purposes, the other two are for saline; two spare funnels; a cylinder with foot, fitted with a graduated pipette, and containing caustic soda solution; an iodine pencil as devised by Major C. F. White for sterilization of the puncture site; and two needles in alcohol. In the remainder of the space are packed ampoules of "606," a small dressing, and a tourniquet.

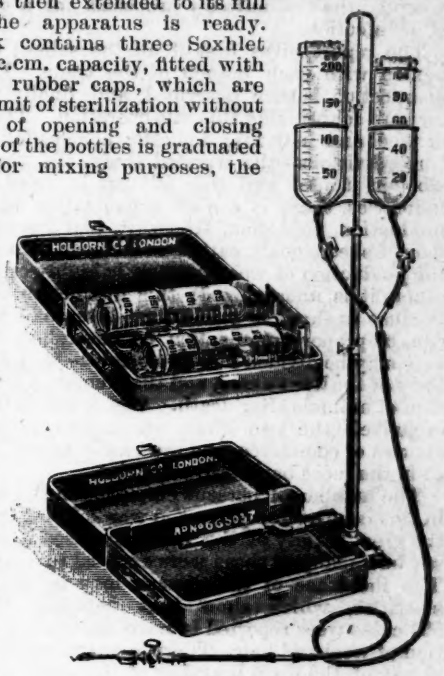

FIG. 1.

The Soxhlet bottles, funnels, and cylinder are sterilized in a steamer, and, thanks to the special caps on the Soxhlet bottles, these can be carried quite safely in the box provided. The "606" is mixed in the graduated bottle, which should contain about 50 c.cm. sterile distilled water, the cap being removed, the powder poured into the water, and the cap replaced for shaking. The soda is then added, to alkalize, and the necessary amount of saline to bring to the required dilution, leaving enough saline for the saline funnel.

PRECAUTIONS AGAINST ANTHRAX.

THE danger of anthrax in the wool trade has for some forty years given rise to anxiety among authorities, employers, and operatives alike, and it has formed the subject of numerous inquiries since 1879, when Dr. J. H. Bell of Bradford first identified the disease then known in that town as "wool-sorters' disease" with anthrax. Since that time much labour and thought have been spent on the subject. The results of the latest investigation have now been published in the report of the Departmental Committee on Anthrax appointed by the Home Secretary five years ago. The Chairman was at first Sir Thomas Whittaker, and later Sir William Middlebrook; the medical members were Professor F. W. Eurich, and Dr. T. M. Legge, His Majesty's Inspector of Factories. The Committee was appointed to inquire into the danger from infection by anthrax in the manipulation of wool, goat hair, and camel hair, with a view to amendment in the regulations for these processes made under Section 79 of the Factory and Workshop Act of 1901. The first volume of the report, previously issued, contained the report of the Disinfection Subcommittee on the experimental investigation of disinfection of wool and hair; the second volume contains the report itself, and the third gives a summary of evidence and several appendices.[1]

The inquiry was much hampered by difficulties directly due to the war. The main problem was to devise a method of disinfection of wool and hair, and, after the evolution of a successful process, to consider the most effective means by which it could be applied for the protection from anthrax of persons working among these materials. The danger of infection being more a question of the material used than of the manner of its use, and the Committee having found a method of disinfection applicable in all branches of the wool trade, further separate inquiry as to

[1] Cd. 9057, 9171, and 9172. London: His Majesty's Stationery Office.

the precautions necessary in different branches of the trade became unnecessary. This was explained to conferences of employers and operatives, who thereupon accepted the Committee's proposals for a general scheme of disinfection.

The report gives first of all the salient points in connexion with each branch of the trade. The method of disinfection is then described, and, finally, a plan is put forward for bringing this into operation. The manufacture of wool and hair into domestic articles follows three distinct divisions—the worsted trade, the woollen or heavy woollen trade, and the felt trade; and behind these industries there is a vast organization of trade in the production, collection, transport, and supply of wool and hair of sheep, goats, cattle, and camels. In some countries the production of wool and hair is highly organized, but in others it is unorganized; this distinction is fundamental because anthrax is primarily a disease of animals which can by proper organization be controlled. All wool and hair may be divided into two classes—that taken from the body of the live animal, and that removed from the body or skin of animals after death. Where the industry is highly organized the two kinds are looked upon as different articles of commerce and are rarely mixed, but this is not so in the more backward countries.

The number of persons employed in the wool industries in this country ten years ago was 260 000, but by reason of the great variety of the materials used it is impossible to say how many of these were exposed to danger of anthrax. The incidence of the disease may be gauged from the statistics, which show that between 1896 and 1917 594 cases were reported to have occurred in the manipulation of wool and hair. There is no indication of a tendency in any of the main branches of the trade towards a reduction in the incidence—rather the contrary. Fatal cases are much more frequent in the worsted branch of the industry, but more cases of anthrax occur in the woollen than in the worsted trade. External anthrax is at the present time much more often reported than the internal form. With regard to the infectivity of material, it appears that all materials must be regarded as being possibly infected, except those derived from countries in which notification and effective measures for the prevention of anthrax are in force. In particular, all materials from Central, Southern, and Western Asia and from Egypt should be held dangerous.

The Committee found that the existing regulations were unequal to coping with the disease, and concluded, further, that the danger was not one which could be dealt with advantageously by factory regulations at all. Thus the Committee reached the position of having either to recommend a code of regulations which would be irksome and ineffective, or to find a suitable method of disinfection of wool and hair. Accordingly a subcommittee was appointed to go into the whole question of disinfection, and succeeded in devising a practicable process. This consists essentially of two parts—the first removing the protection given to the spores by blood and other substances in wool; the second causing disinfection. It was proved beyond doubt that anthrax spores, if sufficiently exposed by the first process, are completely destroyed by the second in less than twenty minutes. If the preliminary treatment is drastic enough, complete exposure of all spores is certain, and this is the key to successful disinfection. Consequently the first recommendation of the Committee is that the policy of trying to control the danger by regulations under the Factory Act should be abandoned in favour of the principle of compulsory disinfection. But disinfection in factories is impracticable, and the Committee recommends that it should be permitted only in central disinfecting stations, the sole business of which is disinfection. Every dangerous variety of material should be disinfected at the earliest possible stage in its passage from the producing to the consuming areas. The infected varieties of wool should themselves bear the cost of disinfection, but the capital cost should be provided in the first instance by the British Government. A State-maintained disinfection authority should be constituted by the Government, with powers and facilities for bringing into operation and enforcing disinfection. When this authority has been established for the organization and control of disinfection, steps should be taken to obtain the co-operation of the Governments of all organized countries. Materials included in the dangerous lists should be allowed to be landed only at fixed ports unless accompanied by a certificate of disinfection. In view of the need for immediate action a small experimental disinfecting centre should be established at once to settle the type of station to be used and the arrangements necessary for bringing the whole scheme into complete operation. Until disinfection becomes operative the question of dust prevention may be allowed to stand over.

Thus the prevention of anthrax must be treated as a world problem if any finality is to be reached in dealing with it. The logical steps by which this conclusion has been reached by the Committee are neatly set out in the final paragraphs of this valuable and exhaustive report. Put briefly, the anthrax spore must be killed near the source if the spread of infection is to be stopped. We may add that the Home Secretary has stated in the House of Commons that the far-reaching proposals of the Committee will be considered and the necessary action taken without delay.

DIETARIES FOR TUBERCULOUS PERSONS IN SANATORIUMS AND HOSPITALS.

IN the JOURNAL of March 9th, 1918, we published the weekly diet scales for tuberculous persons in sanatoriums and hospitals, which had been approved by the Local Government Board in consultation with the Ministry of Food. A circular has now been issued by the Local Government Board substituting new dietaries for those previously laid down. The following are the maximum weekly amounts for each male over 10 years of age residing in a sanatorium or special ward set apart for the treatment of tuberculosis:

Maximum Weekly Amount per Male over 10 Years of Age.

Meat (including suet)*	56 oz.
Fish and poultry	16 oz.
Bacon	8 oz.
Bread	64 oz.
Flour	8 oz.
Sugar	8 oz.
Butter and margarine	10 oz.
Lard and edible fats†	3 oz.
Potatoes	80 oz.
Vegetables (fresh)	28 oz.
Milk	14 pints
Jam, syrup, etc.	8 oz.
Cereals	12 oz.
Oatmeal	8 oz.
Peas, beans, and lentils	8 oz.
Tea	2 oz.
Cheese	4 oz.

* The whole or any part of the meat ration may be butcher's meat.
† Of which more than 2 oz. may be lard.

Since patients suffering from marked constitutional disturbance may be unable to take peas, beans, and lentils, or the full amounts of potatoes and bread specified, any adult male patient certified by the medical officer of the institution to be so suffering and to require additional milk shall be entitled to not more than seven pints of milk weekly (or the equivalent in dried milk prepared from whole or separated milk) in addition to the amount specified. Females over ten years of age, and children under ten will be entitled to four-fifths and three-fifths respectively of the amounts laid down for males over ten, except that in every case the patient will be entitled to 8 oz. of sugar and 3 oz. of edible fats weekly.

The Food Controller has laid down a diet scale for the resident medical and nursing staffs of such institutions, but the scale applicable to patients will apply also to any individual member of the resident professional staff who is suffering from tuberculosis. The amounts of unrationed foods in the scales are not obligatory, but are included for guidance.

THE American National Tuberculosis Association has issued a statement setting forth the pressing need for more tuberculosis hospitals. Accommodation is needed for more than a million tuberculous persons.

AT the annual meeting of the Spanish National Academy of Medicine recently held in Madrid seven prizes of the aggregate value of £1,640 were distributed. The subjects of the successful essays were vaccine therapy, medical geography, and epidemics.

THE MEDICAL PRACTITIONER AS AN ASSET TO PREVENTIVE MEDICINE.

BY

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"MEDICINE," wrote Plato more than two thousand years ago, "is the science of health." To-day it is popularly regarded as the science of disease; otherwise we should be in the habit of paying for medical attendance only while we were actually maintained in good health, and yet, as matters now are, we are taught to live when our life is wellnigh spent.

A revolution in act as well as in thought is necessary if it is hoped to create a national, or indeed an individual, health conscience during the present generation. The establishment of an individual health conscience is, I believe, the ideal we all have in view.

Two tentative schemes to this end are now under discussion:

1. The creation of a central Ministry of Health.
2. The inauguration of a State medical service.

Neither scheme makes one iota of difference to the individual health conscience. The first is purely a paper scheme without any guarantee or suggestion of real progress towards the object in view. As Mr. Percy Alden, M.P., has remarked: "Ideally it is a solution of the problem; practically, for the time being at all events, it is no solution." The second is also an idealistic scheme and at the present time quite visionary, and, however good in itself, is open to all kinds of practical objections. Both schemes as now formulated are open to a further serious objection—that of officializing and stereotyping medicine both in its clinical and its preventive aspects. Medicine is not a subject which will lend itself to the cramping routine of officialism, and under neither of the proposed schemes for simplification, concentration, and unification of the medical services is there any attempt (except in the form of vague promises) to limit the powers and duties of the bureaucracy which it is intended to set up. Medical and sanitary officials, whether they be in the army, the navy, the public health, or other medical services, tend to become both bureaucratic and autocratic. What guarantee is there under either of the proposed schemes that there is to be any alteration in the existing régime or in the system? Precedent and tradition are far too strongly entrenched at the present time to allow themselves to be overcome by the creation of any central Ministry of Health or by any State medical service which is to be organized from above downwards.

Both these proposed schemes appear to be fundamentally wrong in putting the cart before the horse. Moreover, both schemes imply the superimposition from above of health regulations on the national conscience, whereas what is really wanted is to make some effort in the opposite direction with the object of building a health conscience from below upwards. This can be done in two ways—either

(1) by education at school—a method that will need one or two generations to make a real impression; or

(2) by enlisting forthwith in the cause of preventive medicine the goodwill, sympathy, and active co-operation of every medical practitioner.

A fortiori if the machinery for both (1) and (2) is established now and at the same time, the object in view will be the sooner attained.

There is no difficulty in drafting a theoretical or paper scheme for evolving an individual health conscience by means of education, or for making every medical practitioner interested in preventive medicine in all its branches. But now is not the time for theoretical or utopian schemes. What is wanted is some practical scheme to which no person (or rather no body of persons) would raise objection if the scheme were started to-morrow or next year.

Such a practical scheme can be devised to subsidize State service on the part of the general practitioner by paying him an annual grant, and in return requiring service in certain regards as to certificates (births, disease, deaths), sanitary conditions (housing, food, water, employment, etc.), attendance on urgent cases when summoned by midwife, police, or coroner, and reports required by municipal or State medical officers. Many of these services at present are unpaid or inadequately paid, and therefore are often only perfunctorily accomplished. Probably an annual vote of £2,000,000 would cover all these services and result in every family doctor (say 20,000 in all) becoming the medical officer of health of the home and a servant of the State, thus forming a semi-officialized medical service.

In addition to these required duties, and apart from panel practice under the National Insurance Act, practitioners, if suitably qualified, should be encouraged to hold a minor public appointment, such as local doctor for (*a*) schools, (*b*) treatment clinics, (*c*) maternity centres, (*d*) factories, (*e*) police duties, medical referees, and other similar purposes. These appointments should be stereotyped financially and made interchangeable as involving certain definite proportions of time for service. Special posts, such as oculist, aurist, tuberculosis officer, officer to venereal disease clinics, pensions medical officer, legal medical assessor, might be reserved for specialists or consultants.

Criticism of a theoretical nature directed against part-time employment of medical men breaks down when subjected to actual experience and where actual responsibility is felt by the worker. It is with the inefficient bureaucrat who devises schedules and demands useless statistics, and not with the actual responsible worker, that failure chiefly arises. The bureaucrat nearly always fails to appreciate local conditions and local requirements, and insists on literal conformity with his own views rather than individual interest and ideas.

In this connexion it is interesting to call attention to the recent change in the declared attitude towards the medical practitioner of the two Government departments supervising the largest number of medical officials. In June of this year the Chief Medical Officer writes officially to the President of the Board of Education as follows:

> The imposition of new duties and functions by the State does not involve the relegation of the general practitioner to the background. His place in the community is not less but more important.

Again:

> "In the practice of preventive medicine the first line of defence rests with the medical practitioner, who should himself form an integral part of any scheme for the practice of preventive medicine in his area." And again: "Death under 50 or 60 years of age has got to be prevented or avoided, and the medical practitioner is the primary agent in the task."

Only a few weeks ago the professor of medicine at Cambridge, reviewing these official statements, wrote:[1]

> In a chief place I would welcome the emphasis laid upon the general practitioner as the foundation of medicine in this country. . . . Almost unawares a contrary process, that of gradually eviscerating the general practitioner . . ., has been, and is, at work; tuberculosis has been taken from him, the infectious fevers, venereal diseases, childbirth and child-care, and so on; so that general practice may become but a gleaning after the reapers. Sir George [Newman] tells us truly that this tendency is a grievous mistake.

The pity is that this mistake was not realized sooner.

Another Government department—the National Insurance Commission—on the other hand, ever since its inception in 1911 has been fully alive to the value of the general practitioner in the national health campaign, and definitely decided against setting up a whole-time State medical service. The general practitioner has proved himself to be "one of the essential elements" in working the Insurance Act, and thus he is daily playing his part in a great national scheme. If in many respects the full responsibilities entailed on the practitioners have not been realized, it is because no kind of ideal, no kind of guidance, no kind of direction has been offered to them by those in authority at the top.

[1] BRITISH MEDICAL JOURNAL, August 3rd, 1918, p. 113.

Drs. Caroline S. Finley, Anna I. von Sholly, and Mary Lee Edward of New York, who are attached to the American Women's Overseas Hospitals, have been decorated by the French Government, and given commissions as lieutenants in the medical corps of the French army, in recognition of their surgical work and their treatment of the wounded under heavy bombardment in a hospital at the French front.

British Medical Journal.

SATURDAY, NOVEMBER 9TH, 1918.

A NATIONAL LABORATORY FOR THE STUDY OF NUTRITION.

A RESOLUTION of the Inter-Allied Scientific Food Commission, which does not appear to have attracted as much notice as it deserves, dealt with the need of establishing national laboratories for the study of human nutrition. The Commission pointed out that, as at least one quarter of the whole income of a nation was devoted to the purchase of food by its individual citizens, it was a matter of the highest importance for the welfare and prosperity of a country that the methods of utilizing its food resources in the best way should be explored and definitely established on the basis of scientific data. The Commission therefore adopted a resolution urging the allied Governments to establish national laboratories to be devoted to the task. There is no doubt that the want of such a laboratory will be especially felt in the United Kingdom, where the husbanding of our food resources is likely to remain imperative longer than in countries which are normally nearly self-supporting.

The contrast between the extent to which the study of human metabolism has been fostered by the State or left to private enterprise in England and the United States is little to the credit of our rulers. Nor can it be pleaded in extenuation of the neglect that English men of science have shown no signs of being attracted by the problems of nutrition and metabolism. On the contrary, without any depreciation of the labours of such Americans as Atwater and Benedict, or such Germans as Rubner, we can justly claim that the present generation of English physiologists has made contributions to the science of nutrition equal in value to anything which has been achieved elsewhere. We need merely cite the brilliant researches into the chemical mechanisms of digestion which we owe to Starling and Bayliss, the work of Hopkins and his pupils on protein metabolism, and the succession of important contributions to the study of deficiency diseases which have come from the laboratories of the Lister Institute, culminating in the recent work of Dr. Chick and her collaborators.

Since the war the Royal Society, by the agency of its Food (War) Committee, has, with little official aid and, at times, in spite of official indifference or neglect, done much to bring the subject of national dietetics under proper scientific guidance, but we are of opinion that its work will not be extended and made of permanent value to the nation unless effect is given to the Inter-Allied Commission's proposal.

We shall endeavour to make the reason plain by considering one only of the topics within the scope of nutritional research. The Inter-Allied Commission mentioned the need of determining the amount of food required to maintain the health and strength of persons engaged in different occupations. As we had to point out some time since, when the policy of the Food Controller received less inspiration from scientific sources than has happily been the case during the past twelve months, the broad distinctions between class and class, the general laws of human energetics, have been long established. But details which are of great importance when any exact view of the subject is desired, still escape us. To express the energy requirements of agricultural labourers in terms of food with the precision attainable by an actuary in estimating their average expectation of life is still an ideal of the remote future. This is only in part due to the greater difficulty of measuring energy transformations as compared with the measurement of longevity. It is now quite possible by means of relatively simple apparatus to carry out such determinations on a large scale. But the task is not one that any private investigators can be expected to undertake. The mere compilation of statistics of family consumption, a less laborious affair, occupied much of the time of the United States food investigators for years. Here is a proper object for the team work of which so much is heard in these times. It involves physiological skill both in making the measurements themselves and in paying due heed to the attendant circumstances, such as the cooling power of the air in the factory or workshop, a point scarcely heeded by many past students; industrial knowledge is needed to decide what factory processes are *in pari materia* so that representative samples may be chosen for experiment; lastly, some experience in the handling of numerical data is required to decide the significance of departures from the average and the limits of precision of the averages themselves. Nor does it suffice to enrol a suitable team of investigators and send them out into the factories to collect data. The routine application of a physiological technique is the death of science. When a method is intelligently applied upon a large scale anomalous results must emerge, the analysis of which upon a laboratory scale and with the attendant simplification of the conditions may lead to the discovery of new and important truths. The investigating staff must be attached to a head quarters laboratory controlled by a physiologist competent to sift real anomalies from mere technical errors and to cause them to be sedulously investigated. We conceive that in this way alone a really adequate knowledge of the energy requirements of muscular work can be attained.

When it is remembered that this problem, important as it is, is only one of the problems of human nutrition which are still unsolved, we do not think more need be said in support of a national laboratory of nutrition. No doubt the time will come when the intelligent citizen will find it difficult to understand how any nation could neglect to make such a provision for its literally vital needs.

THE THERAPEUTICS OF OXYGEN GAS.

THE report of the Chemical Warfare Medical Committee on the administration of oxygen in irritant gas poisoning is of importance as a contribution to a knowledge of the nature and treatment of conditions due to interference with the oxygen supply to the tissues from whatever cause. When inhaled in sufficient amount the ordinary types of lung-irritant gas produce, usually after an interval of several hours, a condition of pulmonary oedema; the alveolar tissues become swollen and liquid exudes into the alveoli. The absorption of oxygen is interfered with, owing, apparently, to the greater distance which separates the air in the alveoli from the blood. The haemoglobin in the capillaries is less completely saturated with oxygen than usual, and there is an alteration in the colour of the lips and face. If the capillaries are distended with blood the colour is a full blue, or plum colour, and no one hesitates to describe the condition as cyanosis. If the capillaries

are not distended the colour is leaden or grey, and the expression "cyanosis" may then not be used, yet the degree of anoxaemia—that is to say, of defective oxygenation of the blood—is more extreme in the grey cases than in the blue. The condition is very formidable if it continues, either in gas poisoning or in an acute illness such as bronchopneumonia. When the anoxaemia is serious and continued the heart and central nervous system begin to fail, the latter in particular becoming seriously injured, and other organs, such as the heart and kidneys, may also be damaged. The anoxaemia ordinarily seen in gas cases is caused mainly by imperfect oxygenation in the lungs, but in certain others it may be due primarily to a slowing of the pulmonary circulation by partial capillary thrombosis in the lungs, with consequent slowing of the general circulation, so that the blood passes more slowly through the *systemic* capillaries, and consequently loses more oxygen.

Recent investigations at the Canadian General Hospital at Taplow have shown that imperfect oxygenation of the blood in the lungs may be brought about in another way. The degree of activity of the respiratory centre is regulated by the amount of carbon dioxide in the mixed arterial blood, and this depends on the average ventilation of the whole lungs, for the amount of carbon dioxide removed from the blood in any part of the lung depends on the degree of ventilation of that part of the lung; with greater ventilation more carbon dioxide is eliminated. But the conditions affecting the absorption of oxygen in the lungs are different. With ordinary ventilation of any portion of the lung the haemoglobin in the pulmonary capillaries is practically saturated with oxygen. Abnormal increase of ventilation, therefore, is not attended by the taking up of any more oxygen, so that if one part of the lung is insufficiently ventilated there must be a deficit of oxygen in the mixed arterial blood, since over-ventilation of one part of the lung cannot in this respect replace under-ventilation of another. Thus, though with some parts of the lungs under-ventilated the elimination of carbon dioxide may continue at the normal rate, the rate of absorption of oxygen is subnormal, and the condition of anoxaemia is produced. There is experimental reason for saying that even during perfectly normal quiet breathing the ventilation of different parts of the lung is not evenly adjusted to the blood flow, but so long as there is, on the whole, sufficient oxygen to saturate the haemoglobin to about the normal extent the uneven distribution is of no consequence. When, in a perfectly healthy person, the depth of breathing is artificially restricted, its frequency increases to a corresponding extent; and, though the amount of air breathed is also distinctly increased, symptoms of anoxaemia soon show themselves. This is explained by the fact that with shallow breathing only the parts of the lungs which expand readily are ventilated, so that the shallower the breathing, however rapid it may be, the greater the tendency to anoxaemia. If, as happens in irritant gas poisoning, different parts of the lungs are unevenly obstructed by swelling or liquid, uneven distribution of air will be much increased, particularly if the breathing be shallow.

The investigations at Taplow show further that the tendency to uneven distribution of air and consequent anoxaemia is greatly increased in the recumbent position—a fact which explains the orthopnoea accompanying respiratory distress in various diseases. The defence of the body against imperfect oxygenation is in the respiratory centre, which, when it receives such blood, becomes at once more sensitive to carbon dioxide, with the consequence that the breathing is increased. But the point at which this increase takes place varies, so that the respiratory centre cannot be trusted completely to protect the body from the effects of anoxaemia, even when the lungs and heart are normal. Further, the nervous regulation may itself be put out of order, owing to local or general shock, and then anoxaemia may be produced in the absence of any organic injury to the lungs. Experiment and clinical experience show that the anoxaemia of shallow breathing is easily prevented by the addition of quite a small amount of oxygen to the inspired air, and clinical evidence points in the same direction as regards anoxaemia produced in conditions of bronchitis, pneumonia, or asthma. The addition of about two litres of oxygen a minute to the inspired air will about treble the driving pressure of oxygen with normal breathing.

The apparatus used for administering oxygen should make it possible to regulate the flow. The amount given should be determined by the condition of the patient and the improvement in colour produced, and no more should be given than is sufficient to keep the colour normal. Experience shows that as a rule two or three litres a minute are required in gas cases during the acute stage, after which the quantity may be reduced, but as much as five litres may be necessary for a time. For patients who are simply suffering from shallow breathing one litre, or even half that quantity, may be sufficient, as the deeper breathing caused by a face-piece or mask greatly helps the action of the oxygen. With a mask the patient reinhales part of his own expired air, and the carbon dioxide in it, other things being equal, increases his breathing in proportion to the amount reinhaled. By the simultaneous use of oxygen the distress, in so far as it is due to the want of oxygen, is relieved. Then the rebreathed CO_2 simply makes the breathing deeper, and this in itself is usually an advantage.

The present position of the subject may be summed up by stating that there are three causes of anoxaemia: (1) Inflammatory changes in the lungs hindering absorption of oxygen; (2) vascular obstruction in the lungs; (3) irregular distribution of air in the lungs, owing to shallow breathing or partial obstruction of individual bronchi. It is in cases attended by vascular obstruction in the lungs that bleeding may be combined with oxygen administration, and when a case does not respond well to oxygen the probability of obstruction of the pulmonary circulation may be considered. Bleeding, by diluting the blood if it has become concentrated in consequence of loss of plasma, as occurs in acute gas cases, diminishes its viscosity. The increased rate of flow through the lungs will probably far more than compensate for the diminished oxygen-carrying capacity of the blood, which diminishes much less rapidly than the viscosity. When oxygen is not available, bleeding alone will at least relieve the unduly high venous pressure which seems to be always caused by an asphyxial condition of the blood. It may, however, be dangerous in a grey case, as the arterial blood pressure is probably already low. In such cases it may be advisable to give a saline infusion before bleeding.

MEDICAL DEMOBILIZATION.

As already stated in these columns, the Central Medical War Committee has recommended that Royal Naval Volunteer Reserve surgeons and Special Reserve and Territorial medical officers, who have served away from the area of their practices since the beginning of the war and were engaged in private practice at the time of

mobilization, should be released before other medical officers serving temporarily with the forces; a copy of its resolution was forwarded to the Ministry of National Service for transmission to the Interdepartmental Committee on Demobilization. The Ministry of National Service, in a recent memorandum to the War Cabinet, has advised that the early stage of medical demobilization should be guided by this principle, and we understand that the Army Medical Department has agreed that Territorial and Special Reserve medical officers who have served since the beginning of the war should be released first from the army, and that temporarily commissioned R.A.M.C. officers who have served longest should have the first claim for early repatriation, while those who have qualified since the war should be withdrawn from the army last. We may here repeat the view which we expressed a year ago, that medical students who were allowed to continue their studies, or have been withdrawn from combatant service in order to do so, should on joining the profession become automatically available for the medical services of the navy and army during the process of demobilization, and for a period afterwards if needed to maintain the officer strength of the Medical Service R.N., the R.A.M.C., and the Royal Air Force Medical Service. As to the general principle which should govern medical demobilization, we are glad to know that the opinion of the Central Medical War Committee has been adopted by the authorities, and we assume that the machinery of the central professional committees will be made use of to the full in dealing with individual claims for preferential treatment during the process of demobilization, and that their advice will be sought on many matters of detail. While, however, the principle is accepted that those who have served longest and under the hardest conditions should be released first, it must be remembered that difficulties are sure to arise in carrying this into effect—some delay, for instance, must be expected in returning men from distant fronts, and from India, where many Territorial medical officers are serving. In these cases the problem is largely one of transport.

THE PROPHYLACTIC FACE MASK.

VERY striking results have been obtained recently in checking the outbreak of influenza and its complications on transports crossing the Atlantic. Of the two measures found most effective, the first is a careful medical examination of all men before they are admitted on to the transport; any man who is ill, or has recently been ill, is left ashore, where he is kept under observation. The second precaution is the universal use of a face mask. In one recent instance a very large transport, carrying troops numbered by the thousand, had only thirty cases of influenza. Any case of illness arising on the transport is, of course, immediately isolated. In Canadian hospitals in this country and in American hospitals in France the use of the face mask is a matter of routine in wards containing patients suffering from influenza. It is made on the plan of the face mask used by surgeons when operating, and it is perhaps strange that this surgical lesson has not been learnt sooner by medicine. Patients suffering from complications are segregated from others with uncomplicated influenza. After the acute stage the men are kept under observation for ten days in convalescent wards. We have received an interesting note, written in Dublin, from Dr. H. Jocelyn Smyly, of the Union Medical College, Peking. "I had experience," he writes, "during an epidemic of pneumonic plague in the province of Shansi, China. In this, the most infectious disease known, absolute protection can be obtained by the use of a proper face mask. This was amply proved in the Manchurian epidemic some years ago, and in the Shansi Plague Prevention Service not a single worker, foreign or Chinese, was infected. Pneumonic plague, as was demonstrated by Strong in Manchuria, is carried by droplet infection when the patient coughs or even talks. The method employed to guard against it should be equally effective in other infectious diseases similarly conveyed, such as influenza, diphtheria, scarlatina, etc., and ought certainly to be adopted by those in attendance on such cases. The face mask found most effective is prepared as follows: A length of gauze, about 30 in. long and 9 in. broad, is laid on a table; on the middle of the strip is laid a piece of cotton-wool, not too thick, and cut 6 in. by 3 in.; the gauze is then folded longitudinally over the wool and cut lengthwise so as to make three tails from each end of the cotton pad. To apply the mask the cotton pad is placed over mouth and nose, the upper pair of tails pass above the ears and the lower pair below the ears and are tied behind the head; the middle pair are tied over the vertex to prevent the mask slipping down."

THE ETIOLOGY OF INFLUENZA.

IN an article published last week it was stated that the *Bacillus influenzae* of Pfeiffer was practically non-pathogenic to animals. Dr. W. Camac Wilkinson has called our attention to a paper published in 1902,[1] in which he drew attention to the observations of A. Cantani, who had shown that though by the ordinary methods of inoculation—subcutaneous, intraperitoneal, and intravenous—infection of animals failed, rabbits could be infected by intracranial injection. Like the toxins of tetanus, Dr. Wilkinson said, the toxins of influenza are fixed by the cells and elements of the nervous system, and in addition acute infection also occurs; the influenza bacillus can multiply in the cerebro-spinal system, and may be found throughout the cerebro-spinal canal. Dr. Wilkinson also noted that influenza may cause true encephalitis and acute myelitis. Dr. Martha Wollstein, in a more recent paper[2] on the treatment of influenzal meningitis by the serum of an immunized goat, after referring to the frequency and severity of influenzal meningitis, ascertained in Dr. Flexner's laboratory in the Rockefeller Institute by the examination of specimens of the cerebro-spinal fluid withdrawn by lumbar puncture, gives an account of animal experiments with cultures of the *Bacillus influenzae*. She states that the bacilli isolated from the respiratory organs of man were, as a rule, virulent for mice and guinea-pigs, but the virulence of the strains differed and only one was virulent for the rabbit. On the other hand, five out of six meningeal strains proved virulent to young rabbits. Cultures of a virulent strain on blood agar slant twenty-four hours old, when injected under the dura, produced acute meningitis, and *B. influenzae* was recovered from the exudate. The immunizing serum was obtained by injecting a goat, at intervals, with living cultures of a virulent strain of *B. influenzae* for a period of about eighteen months. The efficacy of the serum was tested in monkeys previously inoculated by lumbar puncture with virulent material. Though the animals became extremely ill, and the cerebro-spinal fluid was turbid, they recovered after several injections, but the longest interval between infection and serum injection was twenty-four hours. Influenza bacilli inoculated were found to multiply and to penetrate from the subdural space into the general blood current. As a result of the serum injections the bacilli in the meninges were more freely taken up by phagocytes, their number reduced, their capacity of growth diminished, and their eruption into the blood arrested. The question whether Pfeiffer's bacillus is the true cause of influenza is still undecided, and Dr. Wilkinson is among those who believe that it would be found more constantly if the cultivations were made upon the proper medium—blood agar. There are thus two opposing views: the one that the influenza bacillus is the true virus, and the other that it is a complicating infection ranking

[1] *Australasian Med. Gaz.*, 1902, p. 512.
[2] *Journ. Exper. Med.*, vol. xiv. 1911.

with the haemolytic streptococci, the true virus being a filter passer. Some evidence for this was quoted in the article published last week.

FRANCE'S SHARE IN BIOLOGY AND MEDICAL SCIENCE.

A COURSE of three lectures on France's share in the progress of science has been delivered at University College, London, by M. Henri L. Joly, professeur de sciences physiques et naturelles au Lycée Français. In the concluding lecture, on November 5th, he dealt with biology and the medical sciences, but owing to the wide range of the subject, covering the achievements of at least three centuries, he professed that he could do little more than recite a list of names of greater or less distinction. After references to de Tournefort, Duhamel de Morceau, and Buffon, whom he regarded as a man of letters rather than an exact naturalist, he said that the founder of modern biology in France was Lamarck, who first sought in natural sciences for something beyond description and classification. Xavier Bichat was a pioneer in histology and did much valuable work on the cellular theory. Cuvier was declared to be the greatest of French comparative anatomists, and other naturalists mentioned were Gaudry, one of the early evolutionists; Van Tieghem, to whom every Frenchman studying botany acknowledged a debt; J. H. Fabre, who had done more than any man to popularize natural history in France; Armand Sabatier, the comparative anatomist, and Lecoq, who, the lecturer contended, had anticipated Mendel by twenty years. Turning to Frenchmen whose work had been more particularly in the sphere of medical sciences, after mentioning Mondeville and Guy de Chauliac, M. Joly passed on to the seventeenth century, noting the work of Pecquet on the thoracic duct, of Paris on ergotism, and of Denys, who performed transfusion of the blood in Paris in 1667. Descartes, who was chiefly known in other scientific connexions, did some useful work on visual accommodation, and Lavoisier made a contribution to the chemistry of respiration. He spoke next of Laënnec, of Magendie, who was probably the first experimental pharmacologist; of Le Gallois, who worked on the vagus nerve; of Flourens, who first used chloroform in experiments on animals; of Claude Bernard, who studied the action of the pancreas in diabetes and worked also on the nervous system, and of Paul Bert, his pupil, who organized the teaching of natural sciences in France; of Duchenne, the originator of electrotherapy; of Broca, Charcot, Achard, Dastre, Carrel, and others. The work of Pasteur was dealt with in a previous lecture. In concluding, the lecturer referred to the cordial exchange between British and French science which had been maintained for three centuries, save for the interruption of the Napoleonic wars, and said that whenever French scientists had been persecuted by religious bigots they had always found a refuge in England.

THE CAUSE OF WOUND SHOCK.

THE Société de Biologie, Paris, has arranged to hold a series of inter-allied meetings for the discussion of the biology of war. The first, on October 19th, was on shock. The subject was introduced by Professor Cannon, U.S.A., who said that the characteristics of shock were persistent low arterial pressure, rapid pulse, pallor, sweating, and rapid superficial breathing. Shock, he held, was not due to loss of tone of the vaso-constrictor, nor to fat embolus, nor to acapnia, but to the tissue traumatism—that is to say, its origin was toxic. The phenomena of shock, appearing several hours after the wound, even when the paths of nervous conduction were severed, did not develop if the circulation in the wounded part was arrested, but appeared after it was restored. He therefore advised that, in addition to warming the patient and raising arterial blood pressure, the injured part should be separated from the circulation either by a tourniquet or the knife. Quénu, who followed, agreed that shock was a toxic condition, originating in the injured part; the signs of shock, appearing five or six hours after the wound, were due not to inhibition, but to absorption of toxic products. He mentioned the case of a soldier wounded in the foot, to which a tourniquet was applied. When it was removed nine hours later he was in good condition, but three hours afterwards was suffering from shock, and Professor Cannon mentioned five similar cases. P. Delbet stated that bruised muscle introduced into the peritoneum in animals produced the phenomena of shock. It was manifested first in the nervous system, but later the cells accumulated in the capillaries, leading to diminished oxidation; changes occurred also in the liver cells. Several other speakers referred to the condition of the liver in shock, which they considered to be of importance. The general moral of the discussion seemed to be that it is important to operate in shock as early as possible in order to remove the toxic material.

THE INSURANCE ACT AND TUBERCULOSIS.

WE have received another letter from Dr. B. G. M. Baskett (Rayleigh, Essex), regretting that the Council of the British Medical Association has not appointed a committee to inquire whether there is a causal relation between the Insurance Act and the recent rise in tuberculous mortality. The Council has notified him that such an inquiry is not for it, but for the State. He asks that others who take his view would communicate with him, in order that a second appeal may be made to the Council either itself to institute an inquiry or to urge the Government to do so. Dr. Baskett's appeal rests on the proposition that though the State has made an elaborate attack on tuberculosis, the sequel has been an alarming increase in tuberculosis. It may be well to ask whether the proposition that there has been an alarming increase in tuberculosis can be established. The matter is discussed by Dr. T. H. C. Stevenson, Superintendent of Statistics, General Register Office, in his review of the vital statistics of 1916, prefixed to the report of the Registrar-General for that year. He states that the mortality among the civil population—1,529 per million—was in excess of the total mortality recorded for any year since 1909. The mortality from tuberculosis was, he says, at its lowest in this country during the three years 1912–14, and the rise of the last two years is largely an accidental result of the enlistment of a large army, and to that extent without significance. The increase is accentuated on standardization because mortality from tubercle at military age is normally somewhat above the average at all ages, and particularly so at the present time when the non-tuberculous have been selected for military service. As standardization, he continues, though designed to reduce the effects of population anomalies under ordinary circumstances, has the opposite and undesirable result in the present existence of accentuating them, its use can only darken instead of illuminating comparisons of present with past male mortality from such causes of death as tubercle. He therefore restricts his comparison for 1916 to the female sex, but notes that the curves of mortality for the two sexes normally run so nearly parallel in their yearly fluctuations that the recorded history of female mortality forms the best guide by which to estimate, under the present abnormal circumstances, the extent of the tendency to death from this cause among males. It was found that the mortality, after a fairly steady decline which had continued for many years, reached its lowest level during the three years 1912–14. From the lowest level touched in these years, 1,154 per million females living in 1913, there was a rise of 7 per cent., to 1,235 in 1915, and 1,234 in 1916. Dr. Stevenson then goes on to point out that the circumstances of the female population have been profoundly changed by the war, many thousands being now for the first time subjected to the workshop conditions which have probably

tended so much to maintain the mortality of males at working ages in recent years. The increase of mortality of females does not extend to ages over 45, and in 1916 it particularly affected the most active working period of life—15 to 45. Young women of the most susceptible age have been subjected to risks of infection, as well as of pulmonary disease predisposing to tubercle, which they would have escaped in following their normal occupations; and both from this cause and from the effect of workshop conditions on women already infected, a number have probably died who would have survived under peace conditions. He considers it, therefore, quite possible that with the return of these conditions the fall in tuberculosis mortality may be resumed, though whether this will be so must largely depend upon the nature of the peace conditions to be established. He also notes that the general tendency to increase of mortality from tuberculosis over the rates of the four years 1911–14 is not shared by the rates for children under five years, the rapid decline of which has been a notable feature of the history of tuberculosis in England since the commencement of the century. At these ages the death-rate in 1916 was the lowest yet recorded. The rapid fall of mortality at these ages is a recent and hopeful feature of the returns. We understand that a special report on the subject of the present incidence of tuberculosis is in preparation for the Medical Research Committee. Preliminary examination of the facts available justifies the conclusion that an increase of mortality from tuberculosis among women was to be expected, probably owing mainly to two factors: first, overcrowding in lodgings and old factories ill adapted to the conditions of war-time industry; and, secondly, to the fact that women unaccustomed to town conditions have been attracted to industry by war wages. We believe that the Carnegie Commission for the Study of Tuberculosis in Europe has reached a similar conclusion. The recorded excess over the expected increase in England and Wales has been small. We venture therefore to express the opinion that before any further steps are taken or any wide conclusions are drawn, publication of the result of the statistical examination of the facts should be awaited.

THE AIR FORCE MEDICAL SERVICE.

SIR WATSON CHEYNE, in the House of Commons on October 31st, asked whether the principles laid down in the Air Force Medical Advisory Committee's report last year were now being carried into practice, and what progress had been made. In reply to this and other questions, Major Baird, Under Secretary of State for the Air Ministry, stated that a reorganization of the medical arrangements of the Royal Air Force was now being considered in connexion with the appointment of a successor to the Medical Administrator, whose resignation was due to a difference of opinion between himself and the Medical Administrative Committee with regard to their respective spheres of responsibility. Under the new arrangements the Committee would not be administrative but would carry out advisory functions. On November 4th Major Baird informed Major Terrell that the post of Medical Administrator had been offered to Colonel Fell, A.M.S., one of the conditions of the offer being that he would be guided by the principles laid down in the report of the Watson Cheyne Committee. If this means what it appears to mean the news is welcome; the language is plain, and seems to afford no loophole for misunderstanding. If necessary, Sir Watson Cheyne (who, we regret to learn, has been suffering from influenza) would be able to explain to the House the true meaning of his Committee's proposals, and he will no doubt follow up the question put by Major Terrell should any uncertainty remain with regard to the position. Organized aviation will not end with the war, and it is of national importance to provide that standards of fitness for flying are enforced and that the health of aviators is safeguarded. Early this year we urged the necessity for setting up a separate and complete Air Medical Service organized on scientific principles. The conditions of service in the Royal Air Force Medical Service, which we published on September 28th, 1918, indicated that a considerable advance had been made in this direction, and gave promise of future development upon lines corresponding to the division of medical duties. The medical services of the armed forces, we are convinced, should be grouped for administrative purposes according to function and not according to area. Distribution of medical authority on the basis of areas is contrary to modern ideas of effective organization. The highly specialized conditions of the present time call for a corresponding specialization in the control of medical work. It was to avoid the reproduction in the new Air Force of the army system that the Watson Cheyne Committee first applied itself, recognizing that the maintenance of health, the treatment of disease, and the direction of research, while associated to a certain extent, should be controlled by officers who are experts in the branch of work that they direct—not merely adepts in the routine of administration. We believe that the Committee's proposals would secure decentralization with adequate central co-ordination and control. The special graded pay for the Royal Air Force Medical Service, and the system of promotion solely on grounds of merit, form a praiseworthy departure from precedent; but beyond this it is understood that the Watson Cheyne Committee recommended the formation of a strong advisory board. An explicit assurance on this point is desirable, for the Air Council has not yet professed full adherence to the principles laid down by that Committee. The official statement was that the new Medical Administrator will be guided by those principles.

A DISHONOURED PROFESSION.

IT has been thought well to notice briefly from time to time the official evidence, compiled with legal exactness by Government committees, as to the cruelties inflicted on prisoners in German camps. Some of the facts recorded reflected seriously on the competence and humanity of German members of the medical profession. With regret we have to note that during the debate last week in the House of Commons Sir George Cave added a new count to the heavy indictment previously framed. After referring to cruelties perpetrated on prisoners in the camps, in the salt mines, and on those treacherously employed immediately behind the lines to dig trenches and to set up wire, he said: "There are others, even in the hospitals, where, surely, humanity ought to reign. No doubt there are many humane doctors in Germany, but there are others who make a cruel distinction between British prisoners and other prisoners of war; and even among nurses many are found who, far from helping suffering prisoners, have stooped to inflict insult and injury upon them. The hospitals, as is shown by the condition of our men who are arriving in Holland and Switzerland, are in a very bad state, and our wounded do not get proper treatment." The ill-conditioned behaviour of German Red Cross nurses is no new thing, and has often added deliberate cruelty to insult, but there are exceptions. Mrs. Vincent Smith, the daughter of Colonel Baddeley, British Consul at Bruges, in her account of their captivity in Germany, published in the *Times* on November 2nd, states that the serious condition of her father when they arrived at Aix-la-Chapelle so aroused "the pity of the Red Cross ladies that one brought him some soup, when a doctor nearly knocked the cup out of her hand and asked her what she meant by having pity on an Englishman, and ordered our sentries to take us away." This same doctor a little later came on to the station platform "and collected a crowd, cursed us in English, our sentry and the police officer, and said he would have all English shot if he had his way."

At Giessen one other German woman showed that she was shocked by the ill treatment of Colonel Baddeley, who was being dragged to the camp, and in the camp there was one doctor who "was a good sort, but we had another, a professor, a perfect brute. He told the Red Cross men they were never to speak to me, or do anything for me or give me medicine." It is an ugly picture of the mental and moral standard of one of the leaders of the German medical profession. It is known that all the prisoners' camps are not equally bad, and Sir George Cave accounted for it on the ground that the commandants are independent of the Government and even of the War Ministry, being responsible only to the Kaiser. Some camps are now, at all events, reasonably well organized, but "there are others," Sir George Cave said, "where the conditions are to me unspeakable; the cruelty, inhumanity, and brutality going on are almost past the belief of any human being." This is done on the Kaiser's responsibility, but punishment ought to be meted out to those members of the medical profession who have disgraced their calling by making themselves the willing instruments of his cruelty, inhumanity, and brutality. Sir George Cave stated, on November 5th, that the names of all army commanders or other persons who are known to have been guilty of, or to have encouraged cruelty to our prisoners of war, or to have acquiesced in acts of cruelty by persons under their authority, will be included in the list of persons whose trial and punishment will be demanded by the Allied Governments. On the same day he stated that the German Government had at length agreed to ratify the agreement as to the exchange and treatment of prisoners made at the conference at the Hague.[1] It is a relief to know that British prisoners are not to suffer through another winter, but no credit should be given to Germany for its tardy action in its hour of defeat.

THE ALLIED SURGICAL MISSION IN AMERICA.

The party of European surgeons who went to the United States to attend the congress of the American College of Surgeons which was to have begun in New York on October 21st, have, owing to its postponement, made a tour of the eastern and middle western cities, and are to return to New York this week. The party included Sir Thomas Myles, C.B., of Dublin; Colonel G. E. Gask, D.S.O., consulting surgeon of the Fourth British Army in France; Major George Grey Turner of Newcastle, who served with the British army in Mesopotamia. Lieut.-Colonel Raffaele Bastianelli, professor of surgery at Rome, was the Italian representative; France was represented by Majors Pierre Duval and Andrien Poillet, and by Dr. Henri Béclère of Paris. We learn by cable that the party visited the Mayo Clinic, Rochester, the Minnesota Government Hospital medical schools, and Camp Green Leaf, Chattanooga, Tennessee, and Philadelphia. The arrangements for their visit to New York included a visit to the department of surgery, Columbia University, where they were to be welcomed by President Nicholas Murray Butler, Dean Samuel W. Lambert, Dr. Adrian V. S. Lambert, Director of Surgery, and by the Faculty of Medicine. The addresses were to be given by Colonel Gask on gunshot wounds, by Major Duval on the general principles of the surgical treatment of war wounds, and by Major Poillet on the secondary suture of war wounds. The visitors were to be admitted honorary fellows of the American College of Surgeons by its president, Dr. William Mayo, at a dinner on November 6th, attended by Surgeon-General Merritt W. Ireland, U.S. Army, Surgeon-General William C. Braisted, U.S.N., and Dr. Franklin Martin, member of the Advisory Committee of the Council of National Defence. Visits were also to be paid to the Rockefeller Institute, the United States General Hospital, Bronx, and other military hospitals near New York, and a meeting of the New York Academy of Medicine was to be attended.

[1] British Medical Journal, October 26th, 1918, p. 475.

THE U.S. ARMY MEDICAL SERVICE.

The chief surgeon of the American armies in France has been, until recently, General M. W. Ireland, and with him were General J. R. Kean and Colonel Walter D. McCaw. General Ireland having been appointed Surgeon-General of the American Medical Service, in succession to General Gorgas who retired under the age rule, has now proceeded to America, accompanied by General J. R. Kean. Colonel McCaw has become the chief surgeon of the American armies in France, and General Francis Winter has succeeded General Kean. General Gorgas, who accompanied Mr. Baker, Secretary for War, on his recent visit to France, has returned to the United States, and will probably become associated with the work of the Rockefeller Foundation.

THE NEW PRESIDENT OF THE LOCAL GOVERNMENT BOARD.

The announcement that Sir Auckland Geddes has become President of the Local Government Board and that he will continue to discharge the duties of Minister of National Service will raise great expectations, not only in the medical profession, but among the public, of a real reform of the central health administration. The profession has always desired that the Minister responsible for health administration should be a medical man, and Sir Auckland Geddes fulfils this condition. He graduated in medicine at Edinburgh in 1903, and became successively demonstrator and assistant professor of anatomy in the University of Edinburgh, professor of anatomy at the Royal College of Surgeons in Ireland, and professor of the same subject in McGill University, Montreal. He occupied this chair when the war began. He became Director of Civil Recruiting in 1916, and Minister of National Service last year. The results of the kind of census of the people taken by the Ministry of National Service in carrying out the provisions of the Military Service Acts have revealed the great amount of physical unfitness in the population, only about one-third being found fit to be placed in Grade 1. These facts, which have come to the notice of Sir Auckland Geddes in his official capacity, cannot fail to have produced a strong impression which must influence his action in his new office, and colour the advice as to the establishment of a Ministry of Health which he will be called upon to give to the Government of which he is a member. The Government bill, which, it is said, now bears the title "A bill for the establishment of a Ministry of Health and Local Government," may have been introduced before these words are in print. The title would seem to involve an undesirable compromise, and we hope that Sir Auckland Geddes will be inclined rather to hold that the Ministry of Health should be from the first a real health ministry, having no concern with the administration of the Poor Law, alkali works, and steam whistles. We hope that the bill, while providing for the creation of a Ministry of Health to which would be transferred the health part of the work of the Local Government Board, will equally provide for the immediate transfer of Poor Law and other incongruous branches to some other ministry. The Home Office suggests itself.

A conference was held on Friday, November 1st, between representatives of the following bodies: The Ministry of Health Committee of the Royal College of Physicians of London and the Royal College of Surgeons of England, the Ministry of Health Committee of the Royal Society of Medicine, and the Ministry of Health Committee of the British Medical Association, at the Royal College of Physicians, under the chairmanship of Dr. Norman Moore, President of the Royal College of Physicians of London. Discussion showed a very general agreement between the three bodies concerned, but it was

considered better that they should continue to act independently, meeting in conference again at any time such a step seems desirable or necessary.

At a meeting of the trustees of the Liverpool Royal Infirmary on October 31st Major-General Sir Robert Jones, C.B., F.R.C.S.Eng., Edin., and Irel., was specially elected to the post of Honorary Consulting Orthopaedic Surgeon to the Infirmary.

Medical Notes in Parliament.

The Influenza Epidemic: Work of the Medical Research Committee.—In answer to a question by Mr. Rowntree, Sir Edwin Cornwall has circulated a lengthy statement as to the work of the Medical Research Committee. It states that when the first wave of the epidemic occurred last spring reports of observations from all quarters were published and special researches were organized. The urgent needs of the army for pathological and other investigations, in which the Committee was also engaged, somewhat restricted its efforts. Last autumn the Committee sent to the medical newspapers a summary of important (foreign) communications in regard to influenza, and indicated the likelihood of the onset of a secondary wave in the autumn, one that would be more severe in character than the primary wave of the spring. The anticipation, which could be read in the British Medical Journal of August 10th (p. 139) proved all too fully correct. The Committee had been continuously collecting information which might be useful to the health authorities and the medical profession, gathering from chief foreign sources, and including notes of much work done in Germany and Austria. These reports, together with British observations, were published in the Committee's monthly medical supplements. The Committee was strongly represented at the conference of bacteriologists at the War Office, the outcome of which was published in the British Medical Journal, October 26th, p. 470. The Committee's Bacteriological Department had aided the War Office in the steps taken to provide protective vaccines against complications of secondary infections amongst the troops; suggestions had been made to the Local Government Board to take analogous steps for the benefit of the civil population. It was not the duty of the Medical Research Committee to carry out the actual treatment or prevention of this disease, that being the province of the public health authorities; its province was to obtain new knowledge and information, and it claimed to have performed its part.

Tuberculous Officers.—In reply to a question, on October 31st, as to the position of officers who had contracted tuberculosis on active service, the Parliamentary Secretary to the Pensions Ministry said that the treatment of an officer on half-pay was a matter for the War Office. An officer retired on account of this disability received retired pay and such medical treatment as he required from the Ministry of Pensions on the same conditions as officers retired on other disabilities.

Discharged Tuberculous Soldiers.—Sir Edwin Cornwall, answering for the Ministry of Pensions on November 4th, stated that a scheme for the domiciliary treatment of discharged tuberculous soldiers had been under the consideration of the Pensions Department for six months, and had now been settled in consultation with the Local Government Board and the National Insurance Commission. Sanction for the necessary expenditure was received on May 17th, but no part of the expense had yet been incurred, nor had any new appointments been made. The present scheme was an extension of the arrangements for visiting and for after care already carried out by local committees in many areas. The Local Government Board would shortly issue instructions to local authorities.

Neurasthenic Soldiers.—Mr. Macpherson stated, on November 4th, that the War Office provided fifteen institutions for soldiers suffering from nervous shock and neurasthenia. No purely mental cases were segregated in any institution. The occupations of the men were mainly agricultural, but there were also such indoor occupations as carpentry. None of the institutions was run by a lunacy staff, but in three of them the administrator was a mental specialist. The fifteen institutions to which Mr. Macpherson referred are as follow:

Maudsley Neurological Clearing Hospital, Denmark Hill, S.E.; Springfield War Office, Upper Tooting; Red Cross Military Hospital, Maghull; Abram Peel War Hospital, Bradford; Ewell (County of London) War Hospital, Epsom; 1st Southern General Hospital, Monyhull, Neurological Section, Birmingham; Glen Lomond War Hospital, Fife, N.B.; Dunblane War Hospital, Perthshire, N.B.; Seale Hayne Neurological Hospital, Newton Abbot, South Devon; Gateshead War Hospital, Stannington, Newcastle-on-Tyne; Neurological Section, 4th Southern General Hospital, Plymouth; Neurological Section, 2nd Western General Hospital, Brinnington, Stockport; East Preston Military Hospital, near Worthing; Neurological Section, King George V Hospital, Dublin; Ashurst War Hospital, Littlemore, Oxford.

Ministry of National Service.—Sir A. Geddes, in reply to a question on November 4th, said that under the Acts governing the establishment of the Ministry of National Service the complete abolition of the Ministry is contemplated twelve months after the war, or earlier if so fixed by Order in Council.

THE WAR.

DELAYED PRIMARY SUTURE.

For giving early succour to the wounded dependence must be placed mainly on the field ambulances and the casualty clearing stations. The casualty clearing station is the point to which all the activities of the forward areas converge, and at which anything like elaborate surgery first as a rule becomes possible. The ideal plan is for it to be on a railway at a place where a siding can be made for the ambulance trains, so that men able to walk can find their own way to the train, and those injured in the legs be carried on stretchers. But even in stationary warfare this was not always possible, and the wounded had to be taken to the train by motor ambulances. In the new phase the distance of a casualty clearing station from a railway may be very considerable. This is a disadvantage, but it is a choice of evils; a long distance from the casualty clearing station to the fighting is the greater, for though primarily intended to be the unit which makes ready the wounded for the journey by rail to the base, it must be ready to give active surgical treatment to all who require it. Thus it is not only a clearing but a sorting station, picking out from the wounded reaching it during a push all those requiring immediate operation, and retaining in its beds those unfit to travel.

The casualty clearing station is a mobile unit, and the new phase makes mobility a quality more than ever essential to its efficiency as a part of the organization of an army. It must be able speedily to follow up the advancing troops and quickly to get as far forward as is compatible with a reasonable degree of safety from shelling; absolute immunity from long range guns cannot be assured. A certain risk must be taken, and the nursing sisters who now form part of the staff are quite willing to take it.

When, as happened to the British armies in France during the last three months, a rapid advance is made over a deep and wide stretch of country, a casualty clearing station may have to go forward twenty or thirty miles, or even further. The general practice when the army is moving forward is that the casualty clearing stations leapfrog forwards, those left furthest in rear passing up in front of others which had been the furthest forward.

A casualty clearing station, so soon as it has got its main parts established in new territory, is at once ready to treat any wounded that come to it from the field ambulances. It is prepared to operate on wounds of the abdomen, the chest, and the head, and to retain such patients until the period of acute danger is over. The same principle applies to gunshot fractures of the femur, which are at once subjected to operation, though the period for which they are retained will depend on the condition of the patient, the pressure at the time, and the nature of the facilities for evacuation to a base.

To move up a casualty clearing station is, as has been said, no small operation, and transport far beyond that permanently allotted to it is necessary. It is now commonly arranged on the general plan associated with the name of Major-General Bruce Skinner, who was insistent on the principles which must govern the disposition of its several parts. The site given to it will often be a field to which a side road must be so laid that ambulances coming in and going out do not clash. They draw up at the entrance to the admission marquee or department, whence the lighter cases pass to another marquee, where they are fed and rested, and, if they are to go to the base, wait for the train. The more seriously wounded are carried into the preparation ward, which opens off the admission marquee, and those suffering from wound shock a few steps further into the resuscitation ward, which has a special staff and appliances. The greatest need of a man suffering from wound shock is warmth, and this is usually supplied by a paraffin lamp stove with a flue which passes into a cradle under the bed blankets. Another plan is to put the stove beneath the bedstead with a metal shield under the bed to diffuse the heat. In other instances electricity is the source of heat. Opening off the preparation ward is the operation room; it may be necessary to heat it, and the operating tables, which in periods of stress may number six, must be well lighted. Acetylene is used as a stand-by until the electric light outfit can be got into working order.

When all the special equipment for the operating-room—tables, stools, racks, and so forth—and for the resuscitation ward is added to the weight of beds, and of marquees and poles, blankets, cooking utensils, and the hundred and one appliances needed for the nursing and care of badly wounded men, it will be seen that the whole may be no light load for forty lorries. The introduction of the Bessonneau hut, of waterproof canvas stretched on a light frame, will lessen the weight to be carried and the time spent in taking down and setting up.

A casualty clearing station is prepared to deal with 200 seriously wounded and has beds for that number, but the total admissions may in the course of a few hours be greatly in excess of this. In such circumstances arises a question of policy: What in the interests of the army and of the individual is the wisest way of dealing with the lighter cases? Of all those reaching a casualty clearing station some 40 per cent. will not require operation, their injuries being in the nature of contusions, superficial injuries, and abrasions, or through-and-through bullet wounds with small apertures. The remaining 60 per cent. require operations of some sort, and one half of these, or some 30 per cent. or more of the total wounded, are cases suitable for primary suture. There are surgeons who do not hesitate to say that in the study of the chief surgical problems certain principles have now been reached, and that provided these principles are wisely applied the actual technique is of small importance. The essential point upon which all seem to be agreed is that damaged and infected tissues should be excised rapidly with a firm hand. The opinion is that excision and suture can, except during heavy fighting, be successfully carried out in practically all the cases which require it, provided the surgeons are not diverted from this work by the presence of seriously wounded. To leave the damaged infected tissue in a wound sent to the base is the way to convert a slight into a serious wound. Therefore it has been decided that when there is great pressure at the casualty clearing stations primary excision may be performed there in the lighter wounds, but suture delayed until the man reaches the base. In such cases the wound is lightly packed with gauze at the casualty clearing station. It appears that from 80 to 90 per cent. of cases suitable for excision can be made to heal by primary union, and that the delay necessary for reaching the base before suture does not prevent success.

This represents an enormous saving in the beds that must be provided at the base, in the time for which the man is under treatment, and in the rapidity with which he may return. On one occasion in which the results were carefully watched it was found that a complete success—namely, primary union—was obtained in 84 per cent. by suture at the base following excision at the casualty clearing station, and partial success in 7 per cent.; total failure occurred in 9 per cent. By partial success is to be understood healing of the greater part of the wound cleanly, but the giving way of some small portion, usually owing to tension. The results are better the shorter the time spent in transit. In cases operated on within twenty-four hours the percentage of success was 95; in those in which the operation took place after twenty-four to forty-eight hours the percentage of success sank to 85. Of 67 cases marked "delayed primary suture" at the casualty clearing station which reached a certain base and came under the care of Dr. Crile, 44 were immediately sutured; they were described as superficial wounds, but included two fractures of the humerus and one of the radius. All these cases were successful. Of the total 67 cases, 91 per cent. healed without requiring removal of any stitches, 6.1 were partial successes, and, as defined above, 2.1 were failures. No case was rejected for operation because the infection was thought to have gone too far. In no case did generalized infection occur.

CASUALTIES IN THE MEDICAL SERVICES.

ROYAL NAVY.

Died on Service.

SURGEON COMMANDER T. AUSTEN, R.N.

Surgeon Commander Thomas Austen, R.N., died at the Royal Naval Hospital, Chatham, on October 22nd. He was educated at Charing Cross Hospital, and after taking the diplomas of M.R.C.S. and L.R.C.P.Lond., in 1888, entered the navy, in which he attained the rank of Fleet Surgeon on February 21st, 1905.

SURGEON LIEUTENANT COMMANDER J. HADWEN, R.N.

Surgeon Lieutenant Commander John Hadwen, R.N., was reported as having died on service, in the casualty list published on November 2nd. He was educated at St. Bartholomew's Hospital, and took the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1907. He graduated B.Sc.Lond. in 1905, and M.B. and B.S. in 1907. He entered the navy as surgeon on May 14th, 1909, and in the early part of the war was serving in H.M.S. *King Edward VII.*

ARMY.

Killed in Action.

MAJOR J. MORRIS, M.C., R.A.M.C.(T.F.).

Major John Morris, M.C., R.A.M.C.(T.F.), was killed in action on October 7th. He was educated at Edinburgh University, where he graduated M.B. and Ch.B. in 1904, also taking the F.R.C.S.Edin. in 1909. After acting as assistant surgeon to the Dinorwic Quarries Hospital and as house-surgeon of the Denbighshire Infirmary, he went into practice at Hyde, Cheshire. He joined the 6th Territorial (Stockport) Battalion of the Cheshire Regiment as lieutenant and medical officer on March 8th, 1912, was promoted to captain on August 1st, 1915, and subsequently to major. He received the Military Cross on January 1st, 1917.

CAPTAIN F. C. HARRISON, R.A.M.C.(S.R.).

Captain Frank Cecil Harrison, R.A.M.C.(S.R.), was reported as killed in action, in the casualty list published on November 2nd. He was educated at Sheffield University, and at the Royal Dental Hospital, London, and took the diplomas of L.D.S., R.C.S.Eng. in 1913, and of M.R.C.S. and L.R.C.P.Lond. in 1915. He joined the Special Reserve of the R.A.M.C. as lieutenant on August 10th, 1914, and was promoted to captain on August 3rd, 1915. He was attached to the Duke of Wellington's West Riding Regiment when killed.

Died on Service.

LIEUT.-COLONEL L. P. DEMETRIADI, R.A.M.C.(T.F.).

Lieut.-Colonel Louis P. Demetriadi, R.A.M.C.(T.F.), died at Southport on October 26th, aged 55, after a long illness contracted on active service. He was educated at Leeds Medical School, and took the diplomas of L.R.C.S.I. and L.F.P.S.G. in 1886, also subsequently the F.R.C.S.Ed. in 1889, the D.P.H. in 1892, and the degree of M.D.Dur. in 1905. After serving as house-surgeon of Huddersfield Infirmary he went into practice at Edgerton, Huddersfield. Before the war he held a commission as major on the staff of the 7th (Leeds) West Riding casualty clearing station (T.F.), was promoted to lieut.-colonel on May 3rd, 1915, and had recently been serving at the front in command of that unit. He had received the Territorial Decoration, and had twice been mentioned in dispatches.

MAJOR H. W. CARSON, D.S.O., R.A.M.C.

Major Herbert William Carson, D.S.O., R.A.M.C., was reported as having died on service, in the casualty list published on October 29th. He was born on May 22nd, 1882, and graduated M.B., B.Ch., and B.A.O. of the Royal University, Ireland, in 1905. Entering the R.A.M.C. as lieutenant on July 29th, 1907, he was promoted to captain on July 29th, 1911, and recently to major. He received the D.S.O. on June 4th, 1918.

CAPTAIN N. J. ALLAN, R.A.M.C.(T.F.).

Captain Noel James Allan, R.A.M.C.(T.F.), was reported as having died on service, in the casualty list published on October 31st. He was educated at Liverpool University, where he graduated M.B. and Ch.B. with honours in 1916. After acting as house-physician and house-surgeon of Liverpool Royal Infirmary and as obstetric assistant at Liverpool Maternity Hospital he joined the R.A.M.C.(T.F.) as lieutenant in the 1st West Lancashire Field Ambulance in 1916, and was promoted to captain in 1917.

CAPTAIN E. BOYERS, R.A.M.C.

Captain Edwin Boyers, R.A.M.C., who died recently at Steevens's Hospital, Dublin, was the son of Mr. John

Boyers of Longford. He was educated at Campbell College, Belfast, and Trinity College, Dublin, graduating M.B., B.Ch., B.A.O.Dubl. in 1915. He took a temporary commission as lieutenant in the R.A.M.C., and was promoted to captain after a year's service. He saw over two years' active service in France, and was mentioned in dispatches in December, 1917. Latterly he was stationed in Dublin, and was detailed for duty at Kingstown in connexion with the loss of the *Leinster*, where he contracted pneumonia, which proved fatal.

CAPTAIN R. D. D.-D. BROWNSON, R.A.M.C.(S.R.).

Captain Roger Dawson Dawson-Duffield Brownson, R.A.M.C.(S.R.), died of influenza at Peshawur on October 21st. He was the only son of the Rev. F. Brownson of Compton Greenfield, Gloucestershire, and was educated at the London Hospital and at Cambridge, where he graduated B.A. in 1905 and M.B. and B.C. in 1911, having also taken the diploma of M.R.C.S. and L.R.C.P.Lond. in 1908. He had filled the posts of emergency officer at the London Hospital and of clinical assistant at the Great Ormond Street Hospital. He joined the Special Reserve of the R.A.M.C. as lieutenant on September 30th, 1914, and was promoted to captain on April 1st, 1915.

CAPTAIN C. M. G. CAMPBELL, R.A.M.C.(S.R.).

Captain Charles Montague Gordon Campbell, R.A.M.C. (S.R.), was reported as having died on service, in the casualty list published on November 1st. He took the diplomas of L.R.C.P. and S.I. in 1914, joined the Special Reserve of the R.A.M.C. as lieutenant on February 8th, 1915, and was promoted to captain on August 8th, 1915.

CAPTAIN J. H. CONNOLLY, R.A.M.C.

Captain James Harris Connolly, R.A.M.C., died at the Acheson Military Hospital, Regent's Park, London, on October 23rd, aged 42. He was educated at Edinburgh University, where he graduated M.B. and Ch.B. in 1902 and M.D. with commendation in 1906; and also studied at King's College Hospital, London, at St. Bartholomew's, and at the London and Middlesex Hospitals. After filling the posts of house-surgeon to the Royal Albert Hospital, Devonport, of senior house-surgeon to the Chesterfield and North Derbyshire Hospital, and of resident medical officer to the Throat Hospital, Golden Square, London, he went into special practice in London, and held the appointments of chief assistant in the aural department at St. Bartholomew's and of surgeon in charge of the throat, nose, and ear department at the Queen's Hospital for Children. He took a temporary commission as lieutenant in the R.A.M.C. on October 10th, 1914, and was promoted to captain after a year's service.

CAPTAIN W. MALDEN, R.A.M.C.(T.F.)

Captain Walter Malden, R.A.M.C.(T.F.), died at Cambridge on October 28th, aged 60. He was educated at Cambridge, where he graduated M.A. in 1885, M.B. in 1886, and M.D. in 1905, and at St. Bartholomew's Hospital, taking the diplomas of M.R.C.S. in 1886, and the M.R.C.P. Lond. in 1909. He held the posts of clinical pathologist and director of the clinical laboratory at Addenbrooke's Hospital, Cambridge, and was honorary medical officer of the Charity Organization Society, and of the Cambridge Rescue and Prevention Society. He took a commission as captain in the R.A.M.C.(T.F.) on the staff of the 1st Eastern (Cambridge) General Hospital on May 6th, 1908, and was pathologist to that hospital.

CAPTAIN W. L. MILLAR, R.A.M.C.

Captain William Linton Millar, R.A.M.C., died on active service in France on October 23rd, aged 37. He was educated at Aberdeen University, where he graduated M.A. in 1903, and M.B. and Ch.B. in 1906, after which he went into practice at Forres, where he was medical officer of Kinloss parish, and honorary physician and surgeon to the Leanchoil Hospital. He took a temporary commission as lieutenant in the R.A.M.C. on July 1st, 1916, and was promoted to captain after a year's service.

LIEUTENANT C. BLAKE, R.A.M.C.

Lieutenant Cecil Blake, R.A.M.C., died on October 30th in the Military Hospital at Rugeley Camp, of septic pneumonia, aged 30. He was the elder son of the late Mr. John Blake of East London, South Africa, and had only recently qualified and joined the R.A.M.C.

Wounded.

Major W. B. Allen, V.C., M.C., R.A.M.C.(T.F.).
Major D. McKelvey, M.C., R.A.M.C. (temporary).
Major J. B. Scott, M.C., R.A.M.C.(S.R.).
Captain A. F. Angus, Canadian A.M.C.
Captain G. Davidson, R.A.M.C. (temporary).
Captain F. B. Day, Canadian A.M.C.
Captain H. S. Evans, R.A.M.C.(S.R.).
Captain H. M. Godfrey, R.A.M.C. (temporary).
Captain C. J. Hacker, M.C., R.A.M.C.(S.R.).
Captain R. Lindsay, R.A.M.C.(T.F.).
Captain J. C. Ogilvie, M.C., R.A.M.C. (temporary).
Captain R. E. Pitts, R.A.M.C.(T.F.).
Captain H. A. C. Swertz, R.A.M.C. (temporary).
Captain G. S. Trower, R.A.M.C.(S.R.).
Captain H. P. Whitworth, R.A.M.C.(S.R.).
Captain C. R. Young, M.C., R.A.M.C. (temporary).

DEATHS AMONG SONS OF MEDICAL MEN.

Bond, Frank Bertram, Second Lieutenant Royal Field Artillery, only child of Dr. Bertram Bond of Godalming, killed October 24th, aged 19.

Cuthbert, R. Howard, Royal Fusiliers, attached Army Pay Corps, fourth son of the late Dr. Cuthbert and of Mrs. Cuthbert of Lammas Park Road, Ealing, died of pneumonia in the Military Hospital, Dover, on October 25th, aged 28, after four years' active service.

Maitland-Thompson, Humphrey, Army Intelligence Department, second son of Surgeon-Captain Maitland-Thompson, died suddenly at Richmond Hill, on October 28th, aged 26.

Maurice, Francis Thomas, Lieutenant Grenadier Guards, elder surviving son of Brevet Colonel W. J. Maurice, R.A.M.C. (T.F.), of Reading, died in London of pneumonia, October 29th, aged 26. He was educated at Blundell's School, Tiverton, and at St. John's College, Oxford, where he graduated as B.A., and enlisted in the Public Schools Brigade at the beginning of the war. He went to France as sergeant in November, 1915, got his commission in May, 1917, went to France in December, 1917, and subsequently to Italy. He was demobilized in May last to resume his medical studies at St. Thomas's Hospital. Two of his brothers had previously been killed, Second Lieutenants C. H. C. Maurice and J. C. Maurice, both of the Berkshire Regiment.

Powers, Herbert Grendon, M.C., Captain Hampshire Regiment, only son of Dr. Powers, late of Westend, Hants, killed September 19th. He gained an open scholarship at Wadham College, Oxford, in 1912, and joined the O.T.C. He got his first commission on September 2nd, 1914, and went to India in the following month with the Wessex Territorial Brigade. He afterwards joined the Indian Army Reserve of Officers, served with the 1st Gurkhas in Mesopotamia, and took part in the recapture of Kut, when he gained the Military Cross. He was subsequently transferred to another front.

Scott, William Howard, Private, Essex Regiment, late Lincoln Regiment, second son of the late Dr. Irwin Scott of Hove, killed October 13th.

Sheppard, Charles Westcar, Lieutenant Royal Engineers, only son of Dr. W. J. Sheppard, died at Putney, of influenza and pneumonia, on October 29th, aged 36. He got his first commission on March 1st, 1915, in the Oxford and Bucks Light Infantry, and was subsequently transferred to the R.E.

Weaver-Adams, Philip Clive, Second Lieutenant, younger son of E. Weaver-Adams, F.R.C.S., of Slough, killed in a flying accident on October 28th, aged 19.

MEDICAL STUDENT.

Doyle, Kingsley Conan, eldest son of Sir A. Conan Doyle, M.D., died, aged 25, at St. Thomas's Hospital, on October 28th, of pneumonia after influenza. He was studying at St. Mary's Hospital when war began, and enlisted in the R.A.M.C. He left the army last May to resume his medical studies at St. Thomas's Hospital.

Pedlow, William, M.C., Captain Royal Dublin Fusiliers, who was killed in action on October 12th, was the only son of Mr. William Pedlow, senior inspector of schools, Dublin. He was educated in St. Columba's College, Rathfarnham, and entered the medical school of Trinity College in 1914. He went to Sandhurst at the end of his first medical year. In August, 1915, he received his commission in the Royal Dublin Fusiliers, and became full lieutenant in May and captain in August, 1917. He received his Military Cross in November 1917, and was mentioned in dispatches in December of the same year.

[We shall be indebted to relatives of those who are killed in action or die in the war for information which will enable us to make these notes as complete and accurate as possible.]

HONOURS.

The Albert Medal.

The Albert Medal for gallantry in saving life at sea has been awarded to Surgeon-Lieutenant William Fryer Harvey, R.N. The following is the account of the services in respect of which the decoration has been conferred:

On June 28th, 1918, two of His Majesty's torpedo-boat destroyers were in collision, and Surgeon-Lieutenant Harvey was sent on board the more seriously damaged destroyer in order to render assistance to the injured. On hearing that a stoker petty officer was pinned by the arm in a damaged compartment, Surgeon-Lieutenant Harvey immediately went down and amputated the arm, this being the only means of freeing the petty officer. The boiler room at the time was flooded and full of fumes from the escaping oil. This alone constituted a great danger to anyone in the compartment, and Surgeon-Lieutenant Harvey collapsed from this cause after performing the operation and had to be hauled out of the compartment. Moreover, at any time the ship might have broken in two, and all hands were fallen in on deck, wearing lifebelts, at the time, in order to be ready for this eventuality. Surgeon-Lieutenant Harvey displayed the greatest gallantry and disregard of his personal safety in descending into the damaged compartment and continuing to work there amidst the oil fumes at a time when the ship was liable to sink.

NOTES.

Colonel Howard H. Tooth, C.M.G., after four years' service, two years overseas, has returned to London and resumed duty at St. Bartholomew's and the National Hospitals.

We learn that Captain Shepherd Boyd, R.A.M.C.(T.) has recovered from injuries received in France last summer during the bombing of an ambulance train in which he was serving as medical officer.

Colonel Champe C. McCulloch, jun., M.C., U.S.A., executive officer of the board for collecting and preparing material for a medical and surgical history of American participation in the European war, has arrived in France to establish his administration for this purpose. During his absence Lieut.-Colonel Casey A. Wood, M.C., U.S.A., will be in charge of this work in the Surgeon-General's office.

According to the *New York Medical Journal* of September 28th, 30,519 physicians were at that date in the service of the United States Government; 26,981 of these were in the Medical Corps of the army, 2,818 in the navy, 220 were commissioned as surgeons or assistant surgeons in the United States Public Health Service, while 500 are engaged in the service as control surgeons without commissions. It is estimated that there are about 76,000 physicians of military age in the United States.

Nutrition Officers for the United States Army.

The Surgeon-General of the United States Army has recently announced that nutrition officers are to be stationed in every National Army cantonment and every National Guard camp, as well as in every camp where 10,000 or more men are in training. These officers are food specialists who, before they joined the army as members of the Division of Food and Nutrition of the Medical Department, were connected with colleges and public bodies as physiologists, chemists, economists, food inspectors, and experts in other specialized work relating to food. Since October, 1917, the division has been making surveys of food conditions in camps. Groups of officers have gone from camp to camp noting the food served, the methods of inspection, storage, and preparation, and have made recommendations which have already led to satisfactory results. The officers also gave instruction to medical and mess officers on the principles of nutrition, the selection of foods, and the framing of dietaries. An important part of their work was the enforcement of vigilance in the prevention of waste.

Correspondence.

CHEAP MEDICINE.

Sir,—A sentence in Sir Arthur Newsholme's report invites comment. He says:

National efficiency remains at an unnecessarily low level for lack of medical arrangements, the cost of which will be small in comparison with the benefits obtainable.

This rather suggests the further exploitation of the medical profession and the continued expectation of ninepence for fourpence by the public. Medical service of a high standard, like that of any public service of first importance, can be had at a high cost only. You cannot run an A 1 public health service on a C 3 expenditure. Further on the report reads:

Every patient needs to be studied in relation to his circumstances, and his illness requires to be considered from the point of view of removal of its causes, prevention of their recurrences, and prevention of protraction of disablement.

At the present time this service is expected of medical men under the Insurance Act for a capitation fee of about 8s. per annum, and this contribution from men sometimes in at least as good a financial position as the doctor. As district medical officer I have the care of the sick poor in a small town of over 3,000 inhabitants and of five adjoining villages, one being four miles away, and my salary is rather less than the wage I pay my groom. I should like to add that my experience of over thirty years convinces me that the British workman quite realizes that an efficient medical service is not possible at present prices. Skilled medical attention is required by the people; it is their due, and they are willing to pay the price. The party politician and a soulless bureaucracy are the stumbling-blocks.—I am, etc.,

October 29th. M.D. and M.O.

THE FUTURE OF THE MEDICAL PROFESSION.

Sir,—If nothing better can be done, I readily agree that the proposals of Dr. Peter Macdonald for a National Medical Service would be advantageous both for the public and the profession. But can nothing better be done? We are supposed to guide the public in matters of health; is it consistent, or even in keeping with common sense, that we ourselves should violate the most elementary laws of health by remaining on duty twenty-four hours a day seven days a week?

There is a splendid chance, now that half our number have been for longer or shorter periods in the State service, to make a radical change in our system; and I suggest a plan by which a State doctor would have only a reasonable time on duty each day, and be enabled to put in two months' hospital work every year.

1. A whole-time State service.
2. An adequate salary; say £700 per annum, net, for men under 30; rising by increments of £50 every five years.
3. Compulsory retirement at the age of 60, with pension equal to half salary.
4. Practice to be carried on at central dispensary; State doctors to live where they please, not to practise from their private houses, and not to practise for gain in their leisure time.

Let me illustrate the case in respect to a small town where there is normally sufficient work for twenty-four general practitioners, and a small hospital. The State would provide the central premises; large waiting rooms, consulting rooms, dark room, *x*-ray room, etc., with dispensary attached; also a garage and at least four motor cars, and rooms for dispensers, nurses, chauffeurs, etc. The State would bear the whole expense, and the doctor's salary would be for his own private use. The practitioners would be divided into three groups of eight, who would change every four months.

First Group: Duty from 8 a.m. to 3 p.m., either at dispensary or visiting from dispensary.

Second Group: Duty from 3 p.m. till 10 p.m., either at dispensary or visiting from dispensary.

Third Group: (A) Half on night duty at dispensary (taking all night calls) for two months. (B) Half doing hospital work, eight hours per day, for two months.

(A) and (B) should change about, so that each man has two months' night duty and two months' hospital duty.

On Sundays only two men of the first group and two of the second to be on duty; but no difference to be made with regard to night duty men and hospital men.

During the six months April to September inclusive, each man to have a month's holiday, details of which could be arranged as easily as we have arranged our holiday schemes during the war. Thus, in each year a State doctor would have one month's holiday, seven months' morning or evening duty, two months' night duty, and two months' hospital work.

In this way he would be kept thoroughly up to date; the joint supervision of cases, and the exchange of opinions with his colleagues, would keep him from getting into a groove; and so far from the State patients receiving less efficient treatment than the diminishing number of people who still preferred to employ a private doctor (as Dr. Macdonald fears), they would actually have the benefit of more efficient treatment. Moreover, the scheme would probably be found sufficiently elastic in practice to allow, within fairly wide limits, both free choice of patient and free choice of doctor.

Of course, in every large town there would be consultants and specialists, school doctors, and a tuberculosis officer; also a M.O.H., who should be appointed and paid by the central authority. In each town, too, there would be a senior man, with administrative duties only, to supervise the general practitioners. Each patient would have a record card, with diagnosis, treatment, room for temperatures, notes, etc., so that any doctor looking at this could

obtain at a glance a good idea of the case. Those of us in panel practice who have used the record cards know how exceedingly useful they can be.

In addition to the advantages I have enumerated, a State service would enable us to deal justly with hypochondriacs and malingerers without the annoyance of attempted reprisals; and, generally speaking, we should be able to use our brains more and our tongues less.

I suggest that every practitioner under fifty should be allowed to join the State service by relinquishing his private practice; but if on joining he could prove that his *net* income (over and above business expenses) was more than the State salary he was entitled to at his age, then he should receive from the State two years' purchase of the difference. Thus, a man entering the State service at a salary of £900 per annum, whose previous net income from private practice was £1,200, would receive a lump sum of £600. This may appear rather small, but we must remember that he would work shorter hours and have much less worry; and, as a matter of fact, such cases would be infrequent if the State doctor's salary were fixed at the figure I have suggested.

The State service, of course, would be absolutely free to all patients, rich and poor alike. I should imagine that, with an army of 20,000 State doctors, the cost would be about £25,000,000 per annum—about the same as the cost of the (old) Education Act. In other words, about 10s. per head of the population. But we all hope that before long we shall be able to reduce our present annual expenditure for defence, and the money could not be put to a better use than for a war on disease and the causes of disease.—I am, etc.,

North Shields, Oct. 19th. F. C. MEARS.

SIR,—I was particularly interested to read Dr. Peter Macdonald's article (BRITISH MEDICAL JOURNAL, October 19th, p. 435), since in his par. 4 under heading 2 "A National Medical Service," he expresses views somewhat similar to those expressed by me in "Suggested Hospital Decentralization and Ideas for a State-aided Voluntary Medical Service" (published in the SUPPLEMENT to the BRITISH MEDICAL JOURNAL of September 20th, 1913, p. 258), especially as to the increase in the number of hospitals, the importance of "specialists" being made by their *confrères* choosing them for their ability instead of being self-constituted, and the use of all hospitals as centres for such work as prevention of venereal disease, extension of maternity and child welfare, etc.

The main point is to give every practitioner the opportunity of becoming a "specialist" by being attached (if he choose) to a hospital where he can attend his own patients and continually enlarge his knowledge of all kinds of practice, particularly the one in which he desires to specialize.—I am, etc.,

London, W., Oct. 29th. HARDING H. TOMKINS, M.R.C.S.

INFLUENZA AND ANAPHYLAXIS.

SIR,—Is it not possible that the severity of the present outbreak of influenza is due, in part at least, to anaphylaxis? The time that has elapsed since the summer outbreak suggests this. Granted that the same organisms are at work, increase in severity depends either on increased virulence of the organisms or on increased susceptibility of patients, or on both. The latter may be due to various causes, one of which is anaphylaxis. In the summer outbreak many people suffered, some possibly with only slight symptoms. At the present time it is possible that some of these people are in a state of anaphylaxis. I do not, of course, suggest that the anaphylaxis causes the disease, but if the infection attacks a person in a supersensitive condition he may be so rapidly and profoundly affected as to be unable to offer a normal resistance to the attack of the infective organisms and their allies.

If there is any truth in this hypothesis, it has an obvious bearing on prophylactic treatment by means of vaccines.—I am, etc.,

London, N.W., Nov. 1st. F. J. WOOLLACOTT.

PROBLEMS OF NUTRITION.

SIR,—Major Murlin, Chief of the Division of Food and Nutrition of the Surgeon-General's Office (U.S.A.), read a paper at the April meeting (1918) of the College of Physicians of Philadelphia, which shows that the study of the action of food is being improved by the war.

Having noticed that our recruits, more especially those from rural parts, suffered from indigestion and rheumatic symptoms as soon as they began to be trained, I wrote to Lord Kitchener giving him my views as to the cause, and he at once reduced the beef ration from 1 lb. to ¾ lb. I have spoken to men back from the front, and they tell me they get sick of the beef ration, and do not eat it. The Italian ration is only ½ lb. of beef. Major Murlin says, "Our allowance is 1¼ lb., but the actual consumption in the camps in this country does not exceed ¾ lb. The question may fairly be asked whether the Government would not be well advised to reduce the quota of meat and replace the amount thus saved by sweets provided as a part of the ration."

It would thus appear that the American soldier, like ours, does not eat the whole of the beef, and in spite of leaving some of it has plenty of food, so that the ration of beef might be lessened and nothing put in its place; but if any substitute might be suggested fruit would be much preferable to sweets, for sugar in the inorganic form, as well as salt, ought to be avoided in every dietary.

Since I published my book, which proves that food is the chief cause of disease not only of body but of mind, I have continued the study of the physiological action of our common foods; and, when our Government has a Ministry of Health, which will regulate not only the quantity but the quality of the dietaries in our asylums, insanity will be cured quickly, and in the same way as gout or rheumatism, by proper diet and regimen.—I am, etc.,

Hawick, Oct. 21st. JOHN HADDON, M.D.

BOOT HEELS AS A CAUSE OF FLAT-FOOT.

SIR,—I am not astonished that Dr. T. S. Ellis, referring on October 5th to Captain Fairweather's paper under the above heading, in the JOURNAL of September 21st, commences his criticism by saying that it "contains statements which to me are startling." What astonishes me is that they are not startling to Captain Fairweather himself. Here is a typical statement:

> With heels the spastic condition of the calf muscles makes the front of the foot point downwards, and in walking the knee has to be lifted to let one foot clear the ground, and pass the other.

Where did Captain Fairweather learn his mechanics? With a heel as fulcrum the front of the foot points downwards because the weight of the body falls at the ankle in front of the fulcrum and *pushes* the foot down. Moreover, the statement that the knee has to be lifted to let one foot clear the ground and pass the other, is also utterly false. Captain Fairweather has forgotten that a heel is put on both boots, and the carrying leg is heightened by the amount the swinging leg is lengthened.

The terrible consequences pictured by Captain Fairweather as due to heels are as ridiculous as his premises. "Sprained ankles, the stoop of old age, asthma, varicose veins, weak back and spinal curvature." "Soldier's heart, myalgia, and numerous other ailments." In the mountainous area of the South of France the peasants pass nearly half their time descending hills, commonly with heavy loads poised on their heads. Down the steep slopes the heels are up and the toes down. Yet their erect carriage is frequently remarked on admiringly, and they maintain the perpendicular without "corsets," or consequent flat-foot. French women for generations have worn high heeled boots, when they could get them, and they have generally a better arched foot than their English sisters. Women in England wear high heels more commonly than men, and suffer no more from flat-foot.

The great advantage of heels is that the boot is lifted out of the mud and wet and the foot preserved from damp. Probably a greater gain for durability and health than is commonly recognized. Artistically, too, nothing is more hideous than heelless boots. Is it not time we ceased our pseudo-scientific condemnation of women's apparel? The munition authorities have announced that the wearers of corsets stand the work better than the non-wearers; and men generally are probably more flat-footed than women, and wear out sooner. As Dr. T. S. Ellis points out, we do not yet agree how the arch is supported. Until we do, it is not fair to distort medical science in order to push our hobbies.—I am, etc.,

Clyst St. George, Devon, Nov. 1st. D. W. SAMWAYS.

SIR,—My reply to the letter of Captain Fairweather, relating to mine in the JOURNAL of October 5th, is that I did not intend to imply anything beyond that which I said. To this I adhere.—I am, etc.,

Gloucester, Oct. 26th. T. S. ELLIS.

MEDICAL AUTOGRAPHS.

SIR,—The Reading Pathological Society has lately received from Sir G. H. Makins, for insertion in its albums of medical portraits, holographs, and autographs, an extensive collection of the autographs of distinguished medical men, both British and foreign. Many of these practitioners have passed "beyond the veil," but their names will ever be remembered amongst those of the great benefactors of mankind.

The society now possesses a considerable number of duplicate holographs and autographs which are at the disposal of any other medical society that contemplates forming a similar collection. In the words of Cicero, "Benefactorum recordatio jucundissima."—I am, etc.,

Reading, Nov. 2nd. JAMIESON B. HURRY.

Medico-Legal.

THE COVENTRY CASE.

Pratt and Others v. the British Medical Association and Others.

THIS case was mentioned to Mr. Justice McCardie once more on November 1st, on an application for judgement.

Sir Hugh Fraser (who appeared with Mr. Schwabe, K.C., for the plaintiffs) intimated that the plaintiffs no longer desired to press for an injunction, but would accept the undertaking which had been mentioned on a former occasion.

Mr. Justice McCardie: It will be in the following form: "The defendants undertake that until the hearing of an appeal or the determination of the war, whichever may last happen, they will without prejudice to their rights or contentions in this action, or to the plaintiffs' right to apply to the Court of Appeal for an injunction, in no way interfere with or otherwise obstruct the plaintiffs in the practice of their profession or in their attendance on their patients, and will use their influence with the members of the defendant Association to secure for the plaintiffs full liberty to practise their profession, to attend their patients, and to hold consultations with other members of the profession." The plaintiffs will also have liberty to apply.

Sir Hugh Fraser said that as to the cost of the shorthand notes the plaintiffs were prepared to accept his Lordship's ruling on the last occasion.

Mr. Justice McCardie: There will be judgement for the plaintiffs for £3,810. The amounts to be awarded to each plaintiff can be settled by Sir Hugh Fraser and Mr. Neilson, it being borne in mind that, as to some of the issues, judgement was given against some of the defendants and not against all. As to certain causes of action on which the plaintiffs failed, the defendants will be entitled to the costs of those, and there will be a set off. As regards my judgement, the learned reporter for the *Law Reports* has very kindly pointed out that by inadvertence I omitted to read one page of the manuscript. It should be inserted immediately after the letter of Dr. Suckling which was dated February 20th, 1914 (see the BRITISH MEDICAL JOURNAL, SUPPLEMENT, October 26th, 1918, p. 56, col. 1), and is as follows: "At the same time he wrote to Dr. Burke to say that he would help to smash the boycott. The meeting was held on February 25th, 1914. Dr. Suckling was fully acquitted. But the Coventry Division was not satisfied, for on March 17th, 1914, at a meeting at which (*inter alios*) the defendants Dr. Lowman and Dr. Orton were present, the following resolution was passed: 'That a letter be sent to Dr. Suckling expressing the regret of the Division that he has seen fit to meet a member of the Provident Dispensary in consultation.' Thereupon Dr. Suckling wrote to say that he had committed no breach of any rule. The reply of the Coventry Division to this letter was a letter of censure for doing that in respect of which the Birmingham Branch had held that he was wholly free from blame. The above incidents with regard to Dr. Suckling cast a vivid light on the coercive intention of the defendants' scheme of boycott, and an equally vivid light on the result to any medical practitioner in the Divisions surrounding Coventry who desired to render any medical recognition or advice to a doctor of the Coventry Dispensary."

Mr. McCall, K.C. (who appeared with Mr. Hollis Walker, K.C., and Mr. Neilson for the defendants), said: I have two applications to make. In the first place, I ask that the defendants have the costs of this application. The greater part of the time has been taken up in asking for that which your Lordship has refused.

Mr. Justice McCardie: You were all bound to be here in any case. It was I who suggested that the undertaking be continued. I was reluctant to grant an injunction, as I desired to lessen the asperity which may surround this case.

Mr. McCall: I ask for a stay of execution on the terms of the money awarded by way of damages being invested in War Loan in the joint names of the two solicitors, the costs to be taxed and paid over on the usual undertaking. The defendants to give notice of appeal within fourteen days.

Mr. Justice McCardie: That appears to be reasonable.

Sir Hugh Fraser: I agree on the part of the plaintiffs.

Obituary.

JOHN BIERNACKI, M.D.GLASG.,

Plaistow Fever Hospital.

BY the death of Dr. John Biernacki, physician-superintendent of the fever hospital at Plaistow and the small-pox hospital and tuberculosis sanatorium at Dagenham, institutions which are under the control of the municipality of West Ham, the public health service of this country has lost a most valuable servant. From the day he was appointed to the administration of the establishments mentioned the object he had ever in his mind was to make them models of their kind; and so successful was he in this work that he quickly and deservedly gained a wide reputation as a hospital administrator, and his advice was sought from far and near. In this department of public health he is perhaps especially known for the introduction of what he termed the "barrier system" of nursing cases of certain infectious diseases, under which by a minute attention to details of asepsis these cases could be nursed in a general ward without harm to the other patients or to themselves, though they were separated from the other patients only by a single cord round the bed; a procedure by which the available isolation accommodation of a hospital is greatly economized. Doubtless this method had been in vogue in other hospitals before his time, but only in a crude way; he worked the method out in detail, and showed its limitations as well as its usefulness.

John Biernacki was the second son of Mr. Andrew Thomson Biernacki, for many years in the Indian Government service, and was born in India on September 21st, 1865. After studying at the Glasgow Academy and Glasgow University he took the diplomas of the College of Physicians and Surgeons at Edinburgh in 1889 and graduated M.D. in 1898. At the time of the opening of the Plaistow Fever Hospital in 1895 he was selected as its physician-superintendent from six candidates, having been previously resident medical officer of the Infectious Diseases Hospital at Bootle. He became superintendent of the Harold Wood Convalescent Home and also had charge of the Dagenham small pox hospital during the severe epidemic of 1902-4. He took a deep interest in the personal welfare of his patients, and was far more than their medical adviser; he was the friend of all. The staffs of both sanatorium and the fever hospital were devoted to him and he was ever solicitous for their interests. By them his death is regarded as a personal loss.

He was not a voluminous writer so far as published papers were concerned, but what he did give to the world was excellent. His article on infectious diseases in Bain's *Textbook of Practical Medicine*, and several papers on the pathology and treatment of diphtheria and on intubation (of which he was an ardent advocate) show that he possessed, behind a keen clinical vision, a sound and sure judgement. For some years before his death he had been engaged on a book on the nursing of infectious diseases; and it is to be hoped that the work is sufficiently advanced to be fit for publication. The need for such a volume is pressing.

Much—perhaps, at any rate of late years, most—of his energy, however, was devoted to the improvement of the status and conditions of life of nurses, and especially of those working in fever hospitals. He was the originator and one of the founders of the Fever Nurses' Association, a body which has steadily grown since its beginning eleven years ago, and has done much already to improve the position of fever nurses. But it was not only the fever nurse to whom his sympathy turned, for he spent much time and thought in the bettering of nursing conditions generally. Recognizing that it is only by State recognition that the community of nurses can come into its own, he was a strong supporter of the State registration of nurses, and was a member of the central committee formed some eight or nine years ago to promote that object. He will be greatly missed from the counsels both of the association and the committee. His temperament was inclined to be restless, perhaps because of his Polish descent. He was a

hard worker, unsparing of himself; it is, indeed, to be feared that since the war he worked too hard for a not very robust constitution. He was gifted with a lively sense of humour, so that when in the vein his conversation was most entertaining. The esteem in which he was held was testified to by the large gathering which followed his mortal remains to their last resting place in Ilford cemetery.

Dr. C. O. Hawthorne (London) writes: To those of us who knew him well the late Dr. Biernacki has left many affectionate memories. To know him well, however, was not easy. His sensitive temperament and quality of reserve shut him off from chance acquaintance and even from not a few of his immediate colleagues. To be quiet and non-assertive was indeed an essential habit of the man. Yet behind this habit was a very gentle mind and a great capacity for sympathy and tenderness and interest. In his own field of work he was practical and thorough even to severity. But in wider affairs he was a dreamer of dreams, and it was the artistic and the ethical that really engaged him. Not in a wide circle, perhaps, but certainly in a very affectionate one, his name has a grateful and abiding place.

Dr. R. H. Allen, of Forest Gate, writes: I first met the late Dr. Biernacki at Glasgow University. We were students together when he came to Plaistow Hospital as superintendent some twenty-three years ago. A friendship was made which time has cemented. It was given to very few to know the man. A man of strong character and large intellect, combined with a charming manner, very sensitive to avoid hurting the feelings of others. Children loved him. His powers of conversation were unique. To spend a holiday in his company was an education. To the very few who knew him his memory will always remain.

Dr. James Wilson, Haldane House, Bridge of Allan, late of Ashville, Dumbarton, died on October 28th, at Bridge of Allan, in his 66th year. After studying at the University of Glasgow he obtained the L.F.P.S. and L.M. diplomas in 1882, and settled in practice at Dumbarton. He was medical officer to Dumbarton Combination Poorhouse for nearly thirty years, and in this capacity did much useful work. He was also the means of introducing into all the yards and foundries in Dumbarton Red Cross or ambulance centres, where accidents could be attended and first aid administered. He was the first doctor in Dumbarton to join the British Medical Association, in which body he took a prominent part, being for some time president of the Argyllshire and Dumbartonshire Branch. He was, further, on the staff of the Cottage Hospital, and held the positions of certifying factory surgeon and medical referee of the Ministry of Pensions. His shrewd, kindly, and masterful personality, coupled with his long professional service, commanded the respect of all with whom he came in contact. One of his two sons is in practice in the South of England and one on active service.

Dr. William Starkey, of Rathmines, Dublin, died on October 14th in his 83rd year. He was the oldest member of the profession in the district and was greatly beloved by the poor, whose friend and helper he had been for the greater part of his long and active life. He was the son of the Rev. Wm. Starkey and was born at Bandon, co. Cork, in 1836. He had a distinguished career in Queen's College, Cork, and graduated B.A. in 1857. Later he took the L.A.H.Dubl., and in 1869 the degrees of M.D. and M.Ch., Q.U.I. A man of wide culture, deeply read in the classics and English literature, he contributed to the *Dublin University Magazine* in its palmy days, and was the friend and companion of such famous Irishmen as Robert Dwyer Joyce and George Sigerson. He published in 1875 a small volume of poems and translations, and frequently contributed verse to many journals. He is survived by a daughter and two sons, the elder of whom is the medical superintendent of the Plymouth Asylum, while the younger is widely known as Seumas O'Sullivan, the Irish poet and essayist.

We deeply regret to record the death from heart failure, when apparently convalescing from influenza, of Lieut.-Colonel E. F. Harrison, C.M.G., acting Controller of Chemical Warfare at the Ministry of Munitions. Before he joined the army, soon after the outbreak of war, Colonel Harrison practised as an analytical chemist in London, and was responsible for most of the analyses of proprietary articles in the volumes *Secret Remedies* and *More Secret Remedies*, published by the British Medical Association.

Universities and Colleges.

UNIVERSITY OF OXFORD.

At a congregation held on October 31st the following medical degrees were conferred *in absentia*:

D.M.—Edward H. White, Thomas S. Wright.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

An ordinary comitia of the Royal College of Physicians of London was held on October 31st, the President, Dr. Norman Moore, being in the chair.

The following gentlemen, having passed the required examinations, were admitted as Members of the College: John Cuthbert Matthews, M.D.Camb., L.R.C.P., Stuart Alexander Moore, M.D.Edin., Hugh James Orr-Ewing, L.R.C.P.

Licences to practise physic were granted to ninety-three candidates.

A communication, dated July 25th, was received from the Royal College of Surgeons stating that the Council of that College had decided to omit the names of universities in Germany and Austria-Hungary from the list of hospitals and schools of medicine and surgery published in the College *Calendar* as the places from which certificates of the professional education of candidates for the Membership and Fellowship will be received by the College for the year commencing August 1st, 1918. The communication further suggested that the desirability of also omitting those universities from the published list of the Conjoint Examining Board should be brought under the consideration of the Committee of Management. It was resolved to refer the matter accordingly.

On the motion of the Senior Censor, it was agreed to restore the licence of the College withdrawn from Mr. William Dutton Akers in January, 1912.

Dr. F. W. Andrewes, Sir Humphry D. Rolleston, Dr. Raymond Crawfurd, Sir John Broadbent, and Dr. H. French were appointed on a committee to draw up a pronouncement on the subject of influenza.

The resignation by Sir Frederick Taylor, Bt., of the office of Representative of the College upon the Senate of the University of London was received with great regret.

Dr. Norman Moore and Dr. Henry Head were appointed representatives upon the Conjoint Board of Scientific Societies.

After some formal business the President dissolved the comitia.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

The *Calendar* of the Royal College of Surgeons of England* for the current year contains all the usual information—historical, official, and academic—revised up to August 1st, 1918, together with lists of Fellows and Members, and of licentiates in dental surgery, and diplomates in public health and tropical medicine. The roll of honour of the College now numbers 2[illegible] Fellows, Members, and Licentiates who have been killed in action, or lost their lives from wounds or disease contracted on active service. The report of the proceedings of Council refers to the effect upon hospitals and medical schools of the steps taken by the Ministry of Pensions in conjunction with the War Office to eliminate cases of military injuries, on a very wide definition of "orthopaedics," from treatment in certain civilian hospitals. The Council decided to send a letter to the Director-General, A.M.S., explaining its views, and recommending that a change of name from military orthopaedic hospitals to special military surgical centres be adopted, and that in making appointments to such centres greater consideration should be given to the need for the representation of medical staffs attached to the local civil hospitals, especially teaching hospitals. A short account is given of the work of the Committee of Reference during the year 1917–18. Under the new Military Service Act the committee is investigating the cases of all members of the staffs of hospitals between the ages of 43 and 56; and throughout the year the committee has been constantly engaged in considering the cases of doctors on the staffs of hospitals with a view to determining which of them can be spared for service with the forces. The financial report shows that the gross income of the College, exclusive of that from trust funds, amounted to £20,758, being £304 less than in the previous year. The examination and diploma fees for Membership remain at a satisfactory figure, and the Fellowship fees show no material change, but there was a further decrease of £491 in the fees for the licence in dental surgery. The total expenditure under the revenue accounts was £18,386, being £605 higher than in the previous year. A considerable drop in the revenue for the ensuing year is anticipated. Three hundred and forty-five diplomas of Membership were issued during the year, including thirty-five to women, and five diplomas of Fellowship. The licence in dental surgery was granted to forty-five men and two women. The Conservator of the museum reports the opening of the War Office collection by

* London: Taylor and Francis. 1918. (Demy 8vo. pp. 513. 1s.)

Sir Alfred Keogh a year ago; since then many additions and replacements have been made in all sections, and special mention is made of the large Canadian section prepared by members of the C.A.M.C. It is hoped that Australian and New Zealand sections will be added. The Council of the College, through its museum staff, may justly claim to be rendering in this way a service to military surgery and medicine. Mr. Alban Doran is proceeding with the laborious task of preparing a new descriptive catalogue of the instruments contained in the College collection, while Mr. Victor Plarr, the librarian, is drawing near to the end of his work on the biographies of Fellows. The subject of the next triennial John Hunter medal will be the development of the hip-joint and the knee-joint of man. The subject of the Jacksonian prize for 1919 will be the investigation and treatment of injuries of the thorax received in the war.

GUY'S HOSPITAL MEDICAL SCHOOL.

A RESEARCH fellowship has been founded at Guy's Hospital in memory of the late Ronald William Poulton Palmer, B.A., Lieutenant Royal Berkshire Regiment, killed in action on May 5th, 1915, and of his sister, the late Mrs. Emily Hilda Ainley Walker. The object of the fellowship will be the investigation of the origin, progress, treatment, and cure of obscure diseases in man. Its annual value will be £150. It may be held simultaneously with a teaching post at the Medical School, on condition that the fellow devotes at least half his time to research. The fellowship has been founded by the family and near relations of Mrs. Ainley Walker and Lieutenant R. W. Poulton Palmer, in the hope that others may follow their example. It has been made intentionally of wide scope, because, in the view of the founders, it is unprofitable to endow research in any one disease since advances are made along different lines at different times, largely depending on the elaboration of methods of investigation.

Medical News.

THE next session of the General Medical Council will commence at 2 p.m. on Tuesday, November 26th.

THE Philadelphia Board of Health has placed influenza in the list of notifiable diseases.

THE Babies of the Empire Society, General Buildings, Aldwych, W.C.2, has issued a number of leaflets consisting of extracts from books written by the medical director of the society, Dr. F. Truby King, C.M.G., whose work in reducing the infant death-rate in New Zealand is well known.

TO commemorate the late Sir George Birdwood, whose early life was spent in the Indian Medical Service, it is proposed to establish a lecture bearing his name, to be delivered annually in connexion with the Indian Section of the Royal Society of Arts, with which he was closely associated for forty years.

THE Hospitals Bill, which deals with the hospitals throughout Tasmania that have Government support but no Government control, will have the effect of bringing all hospitals under Government control and supervision to a greater or lesser degree.

THE laboratory of the Royal College of Physicians of Edinburgh is now preparing the mixed vaccine of *B. influenzae*, pneumococcus, and streptococcus, recommended at the recent conference at the War Office (BRITISH MEDICAL JOURNAL, October 26th, p. 470). The cultures are derived from specimens taken from new cases typical of the present epidemic. The mixed vaccine is supplied by Messrs. Duncan, Flockhart, and Co., 104, Holyrood Road, Edinburgh.

A BRANCH of the League of Mercy, called the Wanderers' Branch, has been constituted, with Colonel R. J. Blackham, C.M.G., C.I.E., D.S.O., now D.D.M.S. of an army corps in France, as president, and Lieut.-Colonel E. F. Falkner, D.S.O., as honorary secretary. Communications may be addressed to the president or secretary, at the Army and Navy Club, Pall Mall, S.W.1.

THE Garden Cities and Town Planning Association has arranged to hold in London, on November 29th to December 2nd, the first of a series of schools for lecturers. Visits will be arranged to Letchworth Garden City and the Hampstead Garden Suburb. Further information can be obtained from the secretary at 3, Gray's Inn Place, London, W.C.1.

AT the autumn general meeting of the Irish Medical Schools' and Graduates' Association in London on October 31st, when Dr. Kenneth Frazer, president, was in the chair, a resolution was passed recording the great regret of the members at the loss of their three times elected president, the late Dr. H. Macnaughton-Jones, F.R.C.S.I. It was resolved to send a copy of the resolution to Mrs. Macnaughton-Jones with an expression of sympathy with the family in their bereavement. The members and their friends (including a large proportion of ladies) subsequently dined together to the number of eighty-four. During the evening the Arnott Memorial Gold Medal was presented to Captain Harold Sugars, D.S.O., M.C., R.A.M.C., whose act of bravery in the presence of the enemy was recorded in the *Gazette*.

AT the second meeting of the Central Midwives Board for Ireland on October 31st, the chairman, Dr. E. Coey Bigger, referred in feeling terms to the loss the Board had sustained by the death of one of its members, Alderman J. McCarron, who was drowned in the torpedoing of the ss. *Leinster*. A vote of condolence was passed, and the secretary was instructed to send a copy to Mrs. McCarron. The meeting then considered the rules to be framed under the Act; rules were drawn up regulating the proceedings of the Board, the course of training of midwives, the admission to the roll of women in practice at the passing of the Act, etc.

Letters, Notes, and Answers.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

The postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

The address of the Central Medical War Committee for England and Wales is 429, Strand, London, W.C.2; that of the Reference Committee of the Royal Colleges in London is the Examination Hall, 8, Queen Square, Bloomsbury, W.C.1; and that of the Scottish Medical Service Emergency Committee is Royal College of Physicians, Edinburgh.

QUERIES AND ANSWERS.

INCOME TAX.

M. inquires as to the correct rates of tax applying to an income consisting of (1) earnings £1,409, (2) taxed interest £322, (3) untaxed interest £46, total £1,776.

*** As the total income from all sources is between £1,500 and £2,000—the earnings, £1,409, is taxable at 4s. 6d.; the untaxed interest, £45, is taxable at 5s. 3d.; and a rebate of 9d. is due on the £322, as that will automatically be taxed at 9d. in the £ instead of at the appropriate rate of 5s. 3d.

LETTERS, NOTES, ETC.

THE fifth series of "Facts for Patriots" deals with eggs, animal fats, cocoa, and chocolate. It may be obtained, post free 5d., from the National Food Reform Association, Danes Inn House, 265, Strand, W.C.2. The subjects of previous issues include meat substitutes, the economical use of meat and fish, milk, vegetables, fruit, salads, war bread, and margarine. The complete series of five may be had post free for 1s. 10d.

THE PRESENT TYPE OF PNEUMONIA.

DR. H. B. HILL (Eston, Yorks) writes: Everyone, I daresay, has noticed the correspondence as to the relation of the present cases of pneumonia to influenza. There are at present two distinct varieties of pneumonia. One occurs during an attack of influenza, and follows the usual course in such cases. The other presents the following clinical conditions: A sudden and violent onset of an acute illness in a patient as a rule previously quite well. Expectoration of bright red frothy sputum occurs within a few hours. Epistaxis is frequent; there is a tendency to looseness of the bowels. Albuminuria of moderate severity is often present; delirium is frequent, and is present well up to the end of the pyrexia or even beyond it. The temperature falls by lysis rather than crisis. Heart not usually dilated. Signs of pneumonia are found in the lungs. The pleura seems to be more heavily attacked than is usual in pneumonia, and this is apt to modify the physical signs of the lung condition. The bacteriological report of the last two cases is as follows: "Streptococci, a Gram-positive coccus, and diphtheroid bacilli present. No tubercle bacilli, no pneumococci, no influenza bacilli present."

THE TREATMENT OF PNEUMONIA.

DR. CLAUDE A. P. TRUMAN (Exeter) writes with reference to Dr. Martland's note in the issue of October 26th: I was in the habit of using the first two drugs of his prescription (creosote and potassium iodide) continually for pneumonia and other pulmonary affections during my term of practice in Reading (1891–1906), and I found them most useful. I often used, however, guaiacol instead of creosote for various reasons; and I have found the same drugs, combined with nux vomica, equally useful in many disorders of the stomach and bowel.

SCARLATINIFORM RASH IN INFLUENZA.

DR. H. CAMERON KIDD (Medical Superintendent, Bromsgrove, Droitwich, and Redditch Joint Isolation Hospital) writes: The scarlatiniform rash described by Dr. Robert Kirkland in the JOURNAL of November 2nd (p. 504) has evidently been occurring in this district. In my report to the committee at the end of September I mentioned that three cases had recently been admitted to the hospital from different districts with a bright rash suggesting scarlet fever but without other symptoms of that disease, and that two of these children had developed true scarlet fever within a fortnight of admission. My own idea was that the rash must be a result of some mixed influenzal infection. On October 26th I was asked by Dr. W. H. Rowlands, who had not seen my report, to see five children in the Guardians' Cottage Home who had simultaneously developed a similar rash just five days after mixing with a first case which Dr. Rowlands had very properly decided not to be true scarlet fever, and had kept isolated for a fortnight. In all these cases the rash, though vivid and typical in appearance, was unaccompanied by any other symptoms except a slight initial rise of temperature.

INFLUENZA IN THE LAY PRESS.

Dr. J. MCOSCAR (Buxton) writes: Are we not now going through enough dark days, with every man, woman, or child mourning over some relation, lost owing to one man's aggrandisement? Yet we read in our daily newspapers the enormous fatalities due to the "influenza epidemic." When epidemics occur deaths always happen. Would it not be better if a little more prudence were shown in publishing such reports instead of banking up as many dark clouds as possible to upset our breakfasts? Some editors and correspondents seem to be badly needing a holiday, and the sooner they take it the better for the public moral.

THE SPRAY CHAMBER IN THE PREVENTION OF INFECTION.

SOME time ago we received from Captain E. C. Thwaites, R.A.M.C., a note on the use of a spray chamber in checking the spread of measles. On an outbreak of the disease in a cadet school all members, officers and cadets and permanent staff, were passed through the spray chamber, and no further spread of the disease occurred. As the disease was dying out this experiment was not conclusive, but later another experiment was made. The members of a cadet unit in process of formation came from an area infected with measles, and five cases occurred a few days after arrival. These were promptly segregated and the whole unit, numbering 389, was at once passed through the spray chamber, as were subsequent arrivals from the infected area. No further cases of measles occurred. The spray used was the Levick, which consists of two boiler chambers, an open copper bowl, and a ring burner with asbestos, the whole contained in an iron receiver. The circular boiler is filled with 2½ pints of warm water, the centre boiler with 2½ pints of disinfecting solution (chloramine-T 0.5, 2 per cent. dissolved in water), and the copper bowl with cold water. Half a pint of methylated spirit is poured on to the asbestos ring and lighted, and the boiler placed on top of it. The jets soon begin to emit a fine spray. The apparatus is placed in a room of approximately 1,000 cubic feet and capable of thorough ventilation; while the spray is working it must be tightly closed. Such a room will have accommodation for about thirty men; these should inhale the spray for about eight minutes, and they are then quickly evacuated and another thirty admitted. At the expiration of the second period the spray will have become exhausted. While recharging the spray the room should be thoroughly ventilated. By efficient organization 150 men can be passed through the room in a few minutes over the hour.

EASY CAR STARTING IN COLD WEATHER.

DR. JULES F. REY (Bognor) writes: For years, like many others who do not possess a heated garage, I have experienced the greatest trouble in starting up my car in frosty weather, going to the length sometimes of draining off all the water in the radiator and introducing hot water, flooding the carburettor, injecting petrol in the compression taps, and, in desperation, placing a lighted paraffin lamp under the engine for some hours. These methods are all satisfactory, but require time, and cause a good deal of annoyance, especially when, as usual in the morning, one is in a hurry. Having reached the limit of my patience with the possession of a self-starter car, and determined not to misuse the accumulators, I sat down and devoted a quarter of an hour to thinking out the problem, and, to cut a long story short, proceeded to put my theory into practice. Triumphantly carrying out a kettleful of boiling water (about a pint), at first I cautiously poured the contents over the induction pipes, carburettor, and spraying chamber, putting first of all a small tin cap over the hole on top of the float chamber. I was gratified that at the first turn of the handle, or the first push of the self-starter, the engine started as though on a hot summer's day. One need not be afraid of pouring boiling water over the induction apparatus, as these are all hollow tubes of metal, and no harm can come to them, nor is there any fear of water getting into the carburettor with the engine at rest and a small plug or plate placed over the small hole of the float chamber. I am certain that this simple method will save thousands of motorists untold miseries and curses.

ADMIRALTY SURGEONS AND AGENTS.

MEDICUS writes: Readers of the JOURNAL will have observed an appeal of the Medico-Political Committee to the medical referees under the Ministry of Pensions to state their opinion as to the adequacy of the fees paid by the Ministry for the nature of the work done. Has it not been a cardinal policy of Government departments to exploit the medical profession? Could there be a more glaring example than the petty fees paid to Admiralty surgeons and agents? Yet nobody seems to voice their cause. Can it be that they are themselves supine to the injustice under which they suffer? And yet it only requires a ventilation of their grievances and a combination of effort to have these grievances redressed, to bring the department concerned to acknowledge the just claims of a deserving body of men.

"AN EIGHTEENTH CENTURY QUACK."

A PARAGRAPH with this title, dealing with Sir James Jay, an eighteenth century quack curer of gout, was published on September 21st. Dr. Clippingdale informs us that a most extraordinary coat of arms was granted to Jay: Three Midas heads, black, crowned gold, upon a white field. A Midas head, in heraldry, is, he adds, the head of a man with the ears of an ass.

ERRATA.

IN a portion of the issue of last week's JOURNAL a misprint occurred in the second line of page 494, column one, the figure 49 appearing by mistake for 46. The error was corrected in the latter part of the edition. Another misprint occurred in Dr. Hope Grant's note on the treatment of pneumonia (p. 504); the word "lobar" in the seventh line should be "lobular."

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

Subscriptions to the Second Appeal.

THE following subscriptions have been received up to Monday last, November 4th:

	£	s.	d.
Sir Rickman J. Godlee	3	3	0
North of England Branch B.M.A. (per Dr. J. Don, Hon. Sec.)—			
Dr. R. S. Hubbersty	2	2	0
Dr. J. A. Hislop	1	0	0
Dr. H. Carden Pearson	1	1	0
Dr. R. A. Welsh	1	1	0
Mrs. Ethel Bowman	0	10	0
Dr. H. B. Hunter	0	10	0
Dr. W. Murray	1	1	0
Drs. W. A. and E. G. D. Benson	2	2	0
Dr. D. B. Cama	1	1	0
Dr. M. Maclean	1	1	0
Dr. D. Welsh	1	1	0
Dr. J. R. Burn	2	2	0
Dr. J. Hammond	1	1	0
Mr. E. Spencer Evans (monthly)	0	10	0
Sir A. Pearce Gould (monthly)	5	0	0

Monthly Subscriptions.

The following monthly subscriptions have been received for October:

	£	s.	d.
Dr. Vincent Tighe	0	10	0
Dr. G. Grey Turner	1	1	0
Dr. W. E. Good	0	10	0
Dr. W. Luffman	0	10	0
Dr. R Legat	0	10	6
Dr. A. E. Naish	0	10	0
Dr. T. W. Goodbody	1	0	0
Sir T. Barlow	0	10	0
Surg. P. G. S. Davis, R.N.	0	10	0
Dr. A. B. Stevens	1	0	0
Lieut. J. B. C. Brockwell, R.A.M.C.	0	10	0
Major E. R. Fothergill	0	10	0
Dr. W. S. Hart	1	0	0
Dr. A. Graham	1	1	0
Dr. Hyla Greves	0	10	0
Dr. H. Caiger	0	10	6
Dr. K. J. Dougall	0	10	0
Dr. A. W. Forrest	1	0	0
Dr. T. L. Drapes	0	10	0
Captain H. L. P. Hulbert, R.A.M.C.	1	0	0
Dr. E. C. Morland	0	10	6
Dr. H. Whitehouse	0	10	0
Dr. A. Hawkyard	0	10	0
Dr. W. Stewart	0	10	0

Subscriptions to the Fund should be sent to the Treasurer, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W.1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

THE appointments of certifying factory surgeons at Llanfaircaereinion (Montgomery) and Ballyfeard (Cork) are vacant.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Seven lines and under	0	6	0
Each additional line	0	0	9
Whole single column	4	0	0
Whole page	12	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Wednesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.